Mobile Sound: Media Art in Hybrid Spaces

Frauke Behrendt

Doctor of Philosophy

University of Sussex

April 2010

I hereby declare that this thesis has not been submitted, either in the same or different form to this or any other University for a degree.

Signature:

Date:

Acknowledgements

Parts of chapter five of this thesis have been published before as: Behrendt, F. (2008). Texting and Calling Public Spheres: Mobile Phones, Sound Art and Habermas. In M. Hartmann, P. Rössler, & J. R. Höflich (Eds.), *After the Mobile Phone? Social Changes and the Development of Mobile Communication* (pp. 35-54). Berlin: Frank & Timme.

My first thank you goes to all the artists and participants of artworks for allowing me to interview them for this thesis. Without them this research would not have been possible, and this also holds for all the other artworks of mobile sound art that I experienced over the years, and all the artist I talked to.

I would like to express my deepest gratitude to my supervisors Caroline Bassett and Michael Bull for their never-ending encouragement, support and patience.

I am sincerely indebted to many friends and colleagues who provided generous critical feedback and encouragement: Teri Rueb (Buffalo University), Wendy Maples (Open University), Lalya Gaye and Atau Tanaka (Newcastle University), and of course many colleagues from the Department of Media, Film and Music (University of Sussex) and the Digital+Media Department (Rhode Island School of Design) - Thank you. Many thanks also go to Rolf Grossmann and Martin Warnke (Leuphana University) for encouraging me to pursue my research further.

I am also grateful to the intellectually stimulating comments from the 'Nylon' Network, especially from Richard Sennett, Nick Couldry, Fran Tonkiss, Vic Seidler and all doctoral students. Thank you also to all contributors to the Mobile Music Workshop series for their inspiring artworks, presentations and discussions. Many members of the European COST Action IC0601: Sonic Interaction Design (SID) and especially its Working Group 'Interactive Art and Music' have also provided valuable comments that I am very grateful for.

Thank you also to colleagues for inviting me to present parts of this research, followed by engaging discussions and probing questions, at the Department of Media Study (University at Buffalo), the Mobile Telephony and Interactive Arts Symposium (Carnegie Mellon University), the Department of Architecture (University of Cambridge), the Mobile Sound Symposium (University of Minnesota), the Embodiment & Mobility Symposium (Rhode Island School of Design), the Tuned City Conference in Berlin, and many more. I would like to thank colleagues for their thought-provoking comments after I presented early ideas of this thesis research at the Graduate Students Conference 'Writing Cities' at Harvard University, the Conference 'Sound, Art, Auditory Cultures' in Copenhagen, the ECREA Workshop 'Digital Culture & Communication' at the University of Sussex, the Conference 'SoundAsArt: Blurring of the Boundaries' in Aberdeen, and at the Doctoral course 'Technology and the Public Sphere' in Bergen.

I would also like to thank the DAAD (German Academic Research Council) for generously funding my doctoral research.

And, of course, none of this research would have been possible without the generous support and endless understanding of my family, my partner and my friends and I am deeply indebted to all of them - a heartfelt thank you for always believing in me.

This thesis is dedicated to my great-aunt Wilma.

UNIVERSITY OF SUSSEX

FRAUKE BEHRENDT

DPHIL IN MEDIA AND CULTURAL STUDIES

MOBILE SOUND: MEDIA ART IN HYBRID SPACES

SUMMARY

The thesis explores the relationships between sound and mobility through an examination of sound art. The research engages with the intersection of sound, mobility and art through original empirical work and theoretically through a critical engagement with sound studies. In dialogue with the work of De Certeau, Lefebvre, Huhtamo and Habermas in terms of the poetics of walking, rhythms, media archeology and questions of publicness, I understand sound art as an experimental mobile and public space.

The thesis establishes and situates the emerging field of mobile sound art by mapping three key traditions of mobile sound art - locative art, sound art and public art - and creates a taxonomy of mobile sound art by defining four categories: 'placing sounds', 'sound platforms', 'sonifying mobility' and 'musical instruments' (each represented by one case study). In doing so it develops a methodology that is attentive to the specifics of the sonic and mobile of media experience. I demonstrate how sonic interactions and embodied mobility are designed and experienced in specific ways in each of the four case studies - 'Aura' by Symons (UK), 'Pophorns' by Torstensson and Sandelin (Sweden), 'SmSage' by Redfern and Borland (US) and 'Core Sample' by Rueb (US) (all 2007).

In tracing the *topos* of the musical telephone, discussing the making and breaking of relevant micro publics, accounting for the polyphonies of footsteps and unwrapping bundles of rhythms, this thesis contributes to understanding complex media experiences in hybrid spaces. In doing so it critically sheds light on the quality of sonic artistic experiences, the audience engagement with urban, public and networked spaces and the relationship between sound art and everyday media experience. My thesis provides valuable insight into auditory ways of mobilising and making public spaces, non-verbal and embodied media practices, and rhythms and scales of mobile media experiences.

List of Illustrations[1]

1. * Indicates pictures taken by me. Other visual material was generously provided by the artists or is available on their web sites, some historic images are taken from books (as referenced in the relevant chapters).

Table of Contents

Introduction

In 2001 - a time of monophonic ringtones and before the first iPod - I experienced Levin's 'Telesymphony' (Levin, 2003) when a concert hall audience became a mobile phone orchestra. This is when I first became intrigued by the possibilities of using mobile media for making music and sound art. After encountering Tanaka's 'Malleable Mobile Music' (distributed flânerie turned collaborative remixing, see Tanaka, 2004), Gaye's 'Sonic City' (using the city as interface for electronic music making, see Gaye & Holmquist, 2004) and Rueb's 'drift' (spatialised sounds drifting in and out with the tides, see Rueb, 2004) in 2004, I became especially fascinated with art and music escaping from traditional music and arts locations such as concert halls and museums. I set out to research how mobile media could enable sound art and music-making to 'spill' out into our streets.[1]

This thesis explores what mobility does to sound art by looking at works of mobile sound art from the point of view of how they are made and how they are experienced. I work with four specific case studies from the growing field of mobile sound art: 'Pophorns' by Torstensson and Sandelin (Malmö, Sweden), 'SmSage' by Redfern and Borland (New York, US), 'Aura' by Symons (Cambridge, UK), and 'Core Sample' by Rueb (Boston, US); all 2007. All of the pieces resonate with (broader) formations emerging within a fully networked and increasingly mobile society. Putting sound centre stage allows me to focus on the materiality and embodied actions entailed in using digital media in urban spaces.

1. For more detailed descriptions of the mentioned artworks, see p. # (Telesymphony), p.# ('Malleable Mobile Music'), p.# ('Sonic City') and p. # ('drift').

I suggest that there might be a parallel between the "sonic turn" (Porcello, 2007) and the "spatial turn" (Falkheimer & Jansson, 2006) in the Humanities, Social Sciences and Media Studies on one hand and the growing interest in sound (Motte-Haber, 2006), space (De Oliveira, Oxley, & Petry, 2003) and mobile media (Hemment, 2006a) in the arts since the mid-eighties. At the intersection of these developments an increasing number of artists and researchers explore new forms of sonic and spatial interaction experienced by the audience turned participants (Rueb, 2002; Behrendt, 2004; Gaye, Holmquist, Behrendt, & Tanaka, 2006; Tanaka, 2007; Shepard, 2008b).[2]

The central questions this thesis asks concern the quality of the experience of mobile sound art works. How do the artworks allow participants to engage or interact with urban, public and networked spaces? What is the role of sound in this process? How is the process of engaging with mobile media, sound public and social and networked contexts designed or curated by the artist? How are the pieces performed and experienced by the audience, especially in multi-sensory and embodied ways? What is the relationship between these art experiences and everyday media experience?

1. Hybrid Spaces

Layerings of physical and digital spaces[3] have variously been termed 'Networked Cities' (Mitchell, 2003), 'Network Landscapes' (Rueb, 2007), 'Mediascapes' (Cater, Fleuriot, Hull, & Reid, 2005), 'Hybrid Space' (Seijdel, 2006) or 'Hybrid Spaces' (Souza e Silva, 2006), each with their own take on the politics and implications of these developments. They all share a concern with the collapsing of information and urban infrastructures into each other, where the experiencing of urban space and networked media becomes

2. Throughout this thesis, the terms audience, users, interactors and participants are used interchangeably.

3. For me, 'space' refers to more abstract geographic concepts, whereas 'place' indicates the specific and the lived.

'seamless' or indistinguishable and where "urban experience becomes synonymous with technological experience" (Bull, 2007, p. 38). We experience and create these hybrid spaces by simultaneously using digital networks and physical spaces, e.g. by walking while being on the mobile phone, using Wifi in a cafe, GPS in a car, or RFID in a shop. In developing countries, mobile phones are for many the first and often only way to access the internet (Horst & Miller, 2006, pp. 31-32), not only in the urban context where this is most frequently discussed, but also in rural areas where micro-financing and commodity-price services on cell phones are leapfrogging cable infrastructure (Plant, 2009). Although my own work touches only on western urban experiences, this broader context further underlines the importance of researching mobile media experiences.

The publicness of these hybrid spaces is problematic and this thesis concurs with Seijdel's concerns: "Publicness is increasingly enacted in all these places simultaneously and in that sense has become supremely ‘hybrid’ in nature: a complex of concrete and virtual qualities, of static and mobile domains, of public and private spheres, of global and local interests" (Seijdel, 2005, p. 4). Dealing with hybrid spaces challenges our notion of public space and public spheres, and this thesis researches this through auditory culture.

We experience hybrid spaces when we talk on the phone while walking, send text messages while cycling, check GPS maps while driving, change the song while running, read emails while ordering coffees, or follow live football scores on the train, to name a few. In these busy everyday environments paying attention to the screens of our mobile devices is often challenging, especially while being on the move. Alternatives to the screen-based interfaces and visual interaction paradigms that grew out of the PC and laptop era are called for, and one of them is sonic interaction with mobile media. Spoken word (telephony), music (mp3s) and alert sounds (ringtones) are established

parts of the mobile sonic repertoire. But there is a whole world of un-explored or under-utilised possibilities for sound in mobile media and some of them are explored in this thesis.

2. Sound Studies

Traditionally sound - as well as smell, touch and taste - has been neglected in favour of vision and the consequences of this longstanding obsession with the visual can still be felt, despite all the work that has been done over the last decade or more. There has always been a side interest in other senses but the main focus in cultural studies and media studies has been visual, as of course has been the case in art history. The focus on the visual has been paralleled with an isolated view of the different senses, neglecting the interplay between them. Over the last 15 years or so, there has been an increased interest in the senses in various fields, the Journal 'Senses and Society', the exhibition and book *Sensorium* (Jacobson, 2006), the conference 'The Senses' (London College of Music and Media) in 2004, and Jütte's *A Sense of History: A History of the Senses: From Antiquity to Cyberspace* (2004) serve as some of many examples for this growing concern with the multi-sensual and not-only-visual.

Though my thesis focuses on sound, other senses (and the connections between them and sound) are also relevant. Every human experience is multi-sensual and in everyday life we do not use any one sense in isolation, but use all our senses in concert to make sense of the world and ourselves. I suggest that it might be helpful to talk about prioritising of senses rather than isolating one or several senses. While in every day life we process all these different sense perceptions without necessarily being aware of them, sensory arts such as sound art "break through these automatisations" of everyday sense perception, as Motte-Haber argues (2002, p. 35). She adds that the "new contextu-

alisation of sense perception then disturbs our belief that the learned routines of daily orientation provide an objective image of reality" and the examples of art works discussed in this thesis show how mobile art can challenge our sound and mobile media routines and our sense of how Everyday Life is constituted.

Within this larger sensory shift, sound has emerged as a prominent research focus. The last decade or so has seen a steady increase in the interest in sound in a variety of disciplines with a growing body of publications, conferences[4] and art exhibitions. This emerging area of research that is concerned with the social, political, historic, perceptual, utopian and artistic potential of sound is increasingly referred to as 'Sound Studies'. Seijdel stated in 2005 that "[w]ithin ‘cultural studies’, ‘sound studies’ has emerged as a serious area of research that focuses on the history of audio media, on reflection about the nature of sound and listening or on the role of sound in modern experience and perception" (Seijdel, 2005, pp. 4-5). Overview articles of the 'Sonic Turn' (Porcello, 2007), the role of (digital) media in sound studies (Jensen, 2006; Großmann, 2006), and alternative (but almost synonymous) terms such as 'Audio Studies'[5] that stress their roots in (German) media studies (Großmann, 2006) have been developed. New Musicology has widened the scope of Musicology to include the social role of music but it still remains focused on music, and has left the area of 'sound' to other disciplines for the most part.

The field of sound studies has been built up by a varied body of publications with historic contributions such as Sterne's *The Audible Past* (2003) and Thompson's *The Soundscape of Modernity* (2004); explorations of auditory cultures such as Bull and Back's edition *Auditory Culture Reader* (2003); introductory editions such as to *Sound*

4. Some recent relevant conferences in the area of sound studies include: 'Sound, Art, Auditory Cultures' in Copenhagen in 2006, 'Music, Sound and Reconfiguration of Public and Private Space' in Cambridge in 2008 and "Listening In, Feeding Back" in New York in 2009.

5. The German chapter "Audiowissenschaft = Musikwissenschaft + Medienwissenschaft" translates as "Audio Studies = Musicology + Media Studies?"

Studies (in German), edited by Schulze (2008); and more musical takes on the field such as Cox' edition *Audio Culture* (Cox & Warner, 2005).

There is no journal of Sound Studies yet,[6] but there have been some special issues in journals. For instance the journal 'Social Studies of Science' had a special issue on 'Sound Studies' in December 2004 (Volume 34, No. 5) with an introduction by Pinch and Bijsterveld (2004) in which they aim to define Sound Studies as an

> emerging interdisciplinary area that studies the material production and consumption of music, sound, noise, and silence, and how these have changed throughout history and within different societies, but does so from a much broader perspective than standard disciplines such as ethnomusicology, history of music, and sociology of music. (Pinch & Bijsterveld, 2004, p. 636)

The journal 'Open' had a special issue on 'Sound in Art and Culture' (2005) that focused on the role of sound in public. In the editorial to this journal Seijdel defines sound studies as "a serious area of research that focuses on the history of audio media, on reflection about the nature of sound and listening or on the role of sound in modern experience and perception" (2005, p. 4). And she includes an arts perceptive in her definition, adding that in the arts "research is focused on the potency of sound as an aesthetic, meaningful or communicative element in relation to social or spatial environments" (2005, p. 4).

Several sub-fields of sound studies seem to be forming, such as mobile sound studies or the growing interest around sound and architecture with events such as Tunedcity (Berlin, July 2008), ArchitecTones (France, July 2008) and publications such as *Spaces Speak, Are You Listening?: Experiencing Aural Architecture* (Blesser & Salter, 2006). The field of design, especially in product and interaction design, has also seen an increased interest in emotions, experience, and the senses - especially sound. The new

6. though one or two publishers are rumoured to prepare this.

field of Sonic Interaction Design with a special issue in the 'International Journal of Human-Computer Studies' (November 2009) is one example, the Sensorimix festival in Paris in 2008 another one.

Connor's 1997 conference paper 'Voice, Technology and the Victorian Ear' (1997) shifts the focus from seeing to hearing and traces how emergent technologies, especially telecommunication technologies transformed sound and hearing. He suggests that new telecommunication technology such as radio, telegraph, telephone, loudspeaker or microphone "promoted a reconfiguring of the sensorium in terms of the ear rather than the eye" from the late nineteenth century onwards. How are mobile sound media such as iPods or mobile phones reconfiguring our sensorium? In a similar move to Connor's I ask how hybrid spaces are reconfiguring our senses and especially our auditory perception.

3. Mobility and Sound

At the intersection of mobile media studies and sound studies, a new area of research seems to be emerging. This growing area of research and artistic practice explores the relation of *mobile* media and sound and asks how it plays out in contemporary society.

The mobile sound activities that have sustained the most scholarly attention are mobile music listening (mp3, Walkman, iPod), ringtones and the politics of 'private' telephone conversations in public spaces. The politics of supposedly private telephone conversations in public spaces have been discussed (de Gournay, 2002) and Bassett (2003) develops the concept of attention/inattention and argues that we tend to prioritise auditory spaces in mobile phone culture. Mobile music listening has been researched by Bull's Walkman study (2000) and his iPod study (Bull, 2007) where he shows how users listen to mobile music in order to manage their moods and experiences, a move

which warms up their own private space, but at the same time chills the environment for everybody else.

Other researchers review the differences in the reception of the Walkman and digital music players (Ferguson, 2008), argue for the understanding of mobile music as part of the urban soundscape (Beer, 2007), focus on the experience of control (Simun, 2009), and discuss specific aspects such as music sharing (Bassoli, Moore, & Agamanolis, 2006; Hakansson, Rost, & Holmquist, 2007; Bickford, forthcoming), listening to iPods in the workplace (Haake, 2006), and the role of mobile music listening in solo travelling (Burns & O'Regan, 2008), and educational uses of iPods and podcasts (Cooper, Dalea, & Spencer, 2009). The wider issues of the mp3 and podcasting technologies that are behind mobile media listening are critically interrogated by Sterne (2006, 2008). Ringtones have been researched to a lesser degree than mobile music listening, but there has been a sustained discourse: Gopinath uses ringtones for a critical reading of the 'auditory logic of globalisation' (2005), issues around performativity and identity of ringtones are discussed (Van Elferen & De Vries, 2007) and parallels between music and ringtones in terms of identity and distinction for Finnish youth are drawn (Uimonen, 2004).

Overall, the area of research around mobile sound is still in relatively early stages but scholarly attention is growing. The forthcoming *Oxford Handbook of Mobile Music* (Gopinath & Stanyek, forthcoming) with its inclusive understanding of music as sound underlines this.

4. Theoretical Frameworks

Sound Studies (see p.4) and Sound Art (see p.29) form the two main theoretical frameworks for the thesis. Sound Art and Sound Studies intersect in the everyday - especially when going mobile - and this thesis gets at the poetics of this intersection, and at how it can make strange familiar media and urban experiences so they are 'seen again' or rather 'heard again' by the audience. In later chapters this is explored through the work of De Certeau, Lefebvre, and Habermas, in terms of poetics of walking, rhythms and questions of publicness.

Specifically, I draw on De Certeau's concept of strategies (city planning, for example) and tactics, such as the spatialised speech acts of the city dwellers walking in the urban environment, practising the space and its meaning. Lefebvre's theory also introduces a distinction between abstract and lived space; and Habermas discusses the relationship between lifeworld and system, the latter intruding on, or colonising the former. In hybrid spaces, both the physical and the networked space have a strategic/abstract/systemic side (such as the mobile phone infrastructure and regulations) and a tactical/lived/lifeworld side (e.g. how people actually use or 'make do' with their phones) - this is of course a simplification - but the distinction is still crucial to understanding how media art operates in networked urban spaces.

These theorists of everyday life are apt for analysing (sonic) media *art* experience. Mobile media art draws on everyday media activities and takes place in everyday contexts. Art experience can be understood as one way of living life differently, as Lefebvre suggests is possible during festivals (2008), and as De Certeau observes in Every

Day Life tactics (1984).[7] Mobile media art can be regarded as making everyday media routines unnatural or strange.

I draw on Habermas to discuss how these works of mobile sound art do not just 'happen' in public space (where everyday life takes place alongside the art experience) but also raise questions regarding their engagement with public spheres. Habermas' updated concept (1996) of multiple, occasional and porous multiple spheres allows me to analyse the role of art in moving issues from the periphery to the centre of public spheres, in a kind of agenda-setting function.[8] De Certeau's work enables me to focus on the embodied aspects of interacting with hybrid spaces via sound;[9] while I attend to the temporal aspects of these interactions via Lefebvre's concept of rhythmanalysis.[10]

These concepts of spatial and cultural theory are complemented with a media historic perspective, namely Huhtamo's (1996) concept of media archaeology.[11] Listening out into media history for resonance of topoi - rhythms, reoccurring themes - questions the 'newness' of using mobile media such as mobile phones for making music. 'Old' ways of spatial interaction with the urban environment, such as walking and 'old' ways of interacting with the telephone network both turn out to be crucial for understanding the sound-mobility relationship in contemporary interactions with hybrid spaces.

---

7. For a more detailed discussion, see chapter 'Polyphonies of Footsteps' (p. 173ff.).
8. This argument is developed further in chapter '"Small Texts?"" Text Messages, Art and Public Spheres' (p. 137ff.).
9. See see chapter 'Polyphonies of Footsteps' (p. 173ff.).
10. As developed in chapter 'Rhythmanalysis: Lefebvre on a GPS Sound Walk' (p.203ff.).
11. See chapter 'Musical Telephones Old and New: A Media Archaeology' (p.88ff.).

5. Art as Experimental Space

This thesis makes connections between the research of everyday mobile sound and music and the experimental projects developed by artists that I selected as my case studies. The art space is productive because it is a space that allows people to experiment in ways that they could not do somewhere else. The case studies host, each in a distinct way, a meeting of art and everyday life, a curated encounter of mobile sound. The expectation of art to provide a different experience from everyday life, to be spectacular or even transformative is interestingly similar to the rhetoric around 'new' media that are also supposed to transform our lives for the better.

I offer a critical reading of the transformative potential of the intersection of art and 'new' media by researching how people actually experience the selected artworks. In everyday life sound is often ignored (background noise) but can also annoy us (ringtones) or make us ill (street noise). Experiencing sound art focuses our attention to the world of sound. I understand sound art as a kind of auditory picture frame, that directs our attention towards the aesthetic *potential* of sound. In the case studies, the very sounds we are directed to listen to are a combination of the existing soundscape and sounds added or changed by the artist. Artists often hope to make us listen to the world, listen to it in new ways, to appreciate specific sounds or sound 'itself'.

In this thesis, the case studies are not regarded as isolated 'art encounters', rather the designing of pieces and the experience of participating in the pieces is used as a way of reflecting about both the aesthetic experience of the piece *and* everyday mobile media and sound experiences *and* how they are related. Interviewing people directly after participating in an interactive sound work for instance, enabled me to access often difficult-to-verbalise multi-sensory and embodied media experiences. The interview material

shows how sound art can be productive for understanding contemporary experience of urban space with mobile media. This approach moves away from a focus on devices, applications and even the work itself, towards situated activities. It also allows me to get at a tension between the artists' intentions for the pieces and how they were used and experienced in process: a familiar question in public art, and one that is also raised by interactivity in media and sound art.

6. Thesis Structure

This introduction concludes with a brief outline of the thesis structure: In chapter 1 I consider how the concepts of sound, mobility and publics situate discussions of mobile sound art. Drawing on discourses of locative art, sound art and public art I explore (amongst others) the role of walking as remixing (embodied mobility), trace the tension between (media and sonic) immersion and critical distance (art) and examine the concept of dialogical aesthetics (Kester) in the context of sensory and media art.

Chapter 2 builds on this discussion to develop a taxonomy of mobile sound art by defining four categories: 'placing sounds', 'sound platforms', 'sonifying mobility' and 'musical instruments'. Selected examples from the archive of mobile sound art that I built up over several years illustrate each category. This chapter thus develops a new way of mapping a diverse field and outlines key issues at stake in mobile sound artworks. This taxonomy builds the foundation for the detailed case-study research of the thesis.

In the third chapter, I develop a methodology suitable for the mobile, multi-sensory media experiences I set out the research. My approach considers mobile versions of the concept of media domestication (Hartmann, 2006), methodologies using media art (Silverstone & Sujon, 2005), other creative practices (Gauntlett, 2007) and walking (Hight,

2006) as experimental and embodied methods. I intend to extend this media ethnographic debate with DeNora's musicological considerations. The chapter closes with a summary of my research activities, both for the framing overview chapters outlined above, and the following four case study chapters.

The fourth chapter begins the case studies. It analyses examples of using the mobile phone as a *musical instrument* - 'Pophorns' by Torstensson and Sandelin and the iPhone 'Ocarina' by Wang - with a historical perspective. Drawing on Huhtamo's concept of 'media archeology' I critically interrogate the perception of musical and sonic uses of the telephone as 'new'.

Chapter five examines 'smSage' (by Redfern & Borland, 2007) and two other artworks where the audience's text messages are broadcast into public space in various ways. I set out to show how Habermas' updated concept of multiple public spheres that consist of porous "small texts" resonates with the text messages that establish these mobile sound art *platforms*.

In chapter 6 I draw on De Certeau's (1984) switch from totalising vision to the movement of bodies to explore 'Aura' (by Symons, 2007), where the audience trajectory through a Cambridge park is articulated as paths of 'noise', *sonified mobility*.

Chapter 7 uses Lefebvre's (2004) concept of rhythmanalysis to analyse the role of the artist and the audience in the case study 'Core Sample (by Rueb, 2007). This *placed sound* piece explores layers of history via sound, walking and global mobile technology. Lefebvre's focus on the body and listening is made productive for non-written outcomes of rhythmanalysis such as mobile sound artworks.

In chapter 8 I draw some conclusions by pointing out resonance across the thesis. I show how this research contributes to understanding auditory ways of mobilising and

making public spaces, how it reflects on non-verbal and embodied media practices, and also provides insight into how rhythms and scales are relevant for understanding mobile media experiences.

I. Approaches to Locative, Sound and Public Art

This chapter explores three different influences to constructing my enquiry into the field of mobile sound art. 'Locative art', 'sound art' and 'public art' are antecedents that help produce thinking around the field of mobile sound art both in terms of critical theory and practice. The conversation that this chapter facilitates between these different discourses (that are often interdisciplinary themselves) aims to develop a layered, multi-disciplinary approach for analysing mobile sound art.

1. Locative Art

The term 'locative art' could be broadly defined as referring to experimental and artistic practices from a variety of disciplinary backgrounds, practices that engage the relationship between networked mobile media and the physical and social contexts they create. The term 'locative media' has been coined by Karlins and the history of the term 'locative' art and media is discussed by several theorists and artist (such as Galloway & Ward, 2006; Tuters & Varnelis, 2006, p. 357; Tarkka, 2005, p. 5; Kraan, 2006). Kalnins explains that "locative is a case not a place" (Kalnins, 2004). With his Latvian background, he established the term because the 'locative' cases in his language refers "roughly to the preposition 'in', 'at' or 'by', and indicates a final location of action or time of the action" as Tarkka summarises (2005, p. 7). She argues that the "performative force" of the locative case to inflict or inhabit nouns, that the semantic power of the term allows the debate to move from 'locations' to a more relational understanding of spaces (2005, p. 8).

Russel's introduction to the *Transcultural Mapping Online Reader* (2004), one of the early key collections in the area, sketches out a broad area of interest for locative

media while avoiding a definition of the term. Locative media definitions are often accompanied by long lists of a variety of practices "from participatory annotation of space to platforms for *moblogging* or *biomapping*, from exercises in *psychogeography* and *collaborative cartography* to experiments in public authoring, mobile imaging, sound and performance" (Tarkka, 2005, p. 5) [emphasis by the author]; or "collaborative mapping, open technology experimentation, tactical/surveillance critique, urban gameplay and subjective storytelling" (Hur, On Ni Wan, & Paterson, 2006).

In the 'Locative Media' special issue, Hemment (Hemment, 2006b) regards the term as "a 'test category' for the convergence of geographical and data space" and adds that "[l]ocative media in the broader sense is understood to include bodily, technological and cultural components, combining cultural practices and the embodiment of the user, with various "media" and location sensing technologies such as GPS."[12] Hemment states that practitioners and artists are "exploring the use of portable, networked, location-aware computing devices for social interfaces to places and artistic interventions in which geographical space becomes a canvas."

Hemment (Hemment, 2006a) gives walking a place in his locative arts taxonomy. The first category is "Mapping" with the sub-categories "Open and Wiki Maps", "Figurative, Expressive and Performative" and "Social, Semantic". Many of the projects in the first "Mapping" section are various kinds of visualisations and collections of (GPS) data of urban travels. The second category "Geo-Annotation" is defined as "making data geographically specific or planting digital objects in *space*" (Hemment, 2006a, p. 350) (emphasis by the author). Hemment points out that although the data is in a database, if the access to the information is only possible in a specific physical location, it is experi-

12. This is one of a number of texts used in this thesis where pagination cannot be given because the article was accessed online and no pagination was available. From now on, if no pagination is given, this indicates that the source used was accessed online and no pagination was available.

enced as if it is in that very location. The sub-categories of this category are "Located Media", "Graffiti, Narrative, Gaming" and "Social Authoring", discussing a wide range of art pieces. It is the third category "ambulant" that introduces a focus on "walking and moving about" (Hemment, 2006a, p. 351). This is understood as an additional descriptor to the first two categories. The sub-categories are "Interpretative, Explanatory", "Expressive, Generative" and 'Social, Relational". The last category "ambulant" is especially relevant to this study, as it marks a move from location to mobility, and especially a concern with the mobile, walking body. It is this embodied mobile interaction that I am most interested in.

Bleeker and Knowlton's (2006) taxonomy of locative media is technologically-driven; it distinguishes between "pre-satellite" and "satellite-enabled" locative art, and, focussing on the latter, they argue that the proliferation of GPS enables a "particularly exciting" kind of locative art. To go beyond technologically-driven distinctions, I suggest to focus on the actual experience of participants of locative arts.

1.1 Traces elsewhere or Experience in situ

One could distinguish between two types of locative/mobile pieces: those concerned with some sort of *trace* of a locative art experience and those concerned with the experience *in situ*. The first ('trace') type is more focused on *presenting the result* of locative activities in a different location, in a gallery context or on the Internet, for example. These could be alternative maps, visualisations, or any other representations. These kinds of locative arts projects tend to focus on mapping practices. The various ways of how 'locative art' practices challenge the traditional conception of mapping is discussed by Paraskevopoulou et al (Paraskevopoulou, Charitos, & Rizopoulos, 2008). A key concern is often how the embodied, multi-sensory experience can be translated in some way. If we move the focus from these mapping and tracing projects towards projects

where the mobile experience itself constitutes the piece, this translation problem becomes secondary, and the immediate interaction with the piece *in situ* is the piece. Potentially omnipotent ideas of 'recording' experience in one way or another give way to each person's own experience. Albert (2004) defines locative media as a "'test' category for artwork that utilises media which can express an index of spatial relationships", indicating a concern with the trace, the index, the archive of the spatial relationship, rather than with the experience. Albert argues that many artists focus on the software behind their pieces, rather than on engaging with locations. He observes a lack of connection to the *critical* discourses of 'site-specific' and 'participative' art in these early stages of locative discussions. Albert asks for a critical evaluation of locative arts in these contexts. This thesis aims to add to those voices that have addressed these concerns in the years since publication of this essay.

The second type of pieces are focused on the *experience in-situ*, and are not very interested in later representations of the experience in other locations and times. For me, the process of experiencing media out in the world is more relevant than experiencing the traces of someone else's encounter with the world in an art institution. Traces of the mobile experience in a gallery and "some locative projects may be 'of the world' but are not 'in the world': their final form is on-line or gallery based, rather than experienced via mobile devices or 'old media' such as stickers" (Hemment, 2006a, p. 351). Similarly, Hight (06) does not discuss locative art pieces that rely on traces or other representations of locative activities on art institutions. Like me, he is concerned with the *in-situ* experience of the participants. He focuses on the experience and the fact that this happens "out of the gallery, in the physical world" (Hight, 2006, p. 2). He calls this experience of hybrid spaces "a multi-layered, deep and malleable resonance of place" (Hight, 2006, p. 2).

This distinction of 'traces elsewhere' and '*in-situ* experience' is also resonant in Tuters and Varnelis' understanding of locative art (2006) - though for them both are still concerned with 'mapping'. Tuters and Varnelis (2006) define locative media by introducing two categories of mapping practices: "annotative" practices that are defined as "virtually tagging the world" (Tuters & Varnelis, 2006, p. 359) are discussed in the context of the Situationist's 'détournement'. The second category of mapping practices is defined as "phenomenological - tracing the action of the subject in the world" (Tuters & Varnelis, 2006, p. 359) and is discussed in relation to the Situationist's 'dérive', especially their "mapping-while wandering tactics" (Tuters & Varnelis, 2006, p. 359). Projects in this category are labelled as "privileging the experience of the human in space" (Tuters & Varnelis, 2006, p. 362) and "seek to use high technology to stimulate dying everyday practices such as walking or occupying public space" (Tuters & Varnelis, 2006, p. 359).

1.2 Social Context

In addition to the physical context ('out in the city') and the media context ('mobile' and 'wireless')[13] the social context is another key factor in locative arts. Kraan argues that the link between space and social aspects should be strengthened in locative art. For her, "[lo]cative media art makes use of locative media to annotate space and to bring people together" (Kraan, 2006, p. 39). She asks for locative media "to bring about social contact in physical space", as so far - at least regarding the projects she introduces - this is not happening (Kraan, 2006). Tarkka argument chimes with Kraan's: despite of the defining power of (social) context for this genre, in actual locative practices, this very context gets often lost "in the reductive move from spaces to maps, places to dots and sociality to links" (Tarkka, 2005, p. 22).

13. See also the 'wireless art' section below (p. 23ff.).

Shirvanee (2006) discusses how social aspects of (again, mainly visual) locative media are addressed in art projects. She introduces the term viscosity to evaluate how locative media might enable "flow between social groups" (Shirvanee, 2006). Sharpe (2006) discusses how mobile media art projects engage with a variety of "spaces of alterity". Norman (2006) uses the context of theatre history to discuss the social, spatial and temporal aspects of locative arts. Her broad understanding of theatre includes Mediaeval processions, rural rituals and other public processions and ceremonies. The social dynamics of these events are useful for locative media projects with larger number of participants. For the cases studies of this thesis where only a small number of participants is involved this concept is less productive. For future research, broadening Norman's concept with the sound politics of the spectacle could be promising for large-scale mobile art projects.

Based on the joint importance of context in locative media and archeology Galloway and Ward's (2006) more sociological perspective engages the discourse of archeology to pose some critical questions for locative media projects. They argue that both fields rely on context to evaluate the social and spatial relationships at play. Their more detailed definition of locative media also stresses that "[a]ll locative media projects rely on some sort of (not necessarily equitable) financial, intellectual, political, material, etc. collaboration between government, university, industry and 'independent' artists, designers or researchers" (Galloway & Ward, 2006). As we will see later, the case studies of this thesis are also collaborations in many different ways. Galloway and Ward also add the concerns of "Who gets to set the rules of engagement? What are the power relations at play?" to the locative art debate (Galloway & Ward, 2006). These power relationships are not only at play between, for example, commercial network carriers, pro-

prietary software on mobile devices, and the artist; but also between the artist(s) and the audience.

The hope of 'locative art' to facilitate an escape from art institutions (Hemment, 2006a, p. 351) is a re-occurring theme. One of the impulses of locative media is to escape from the immobile screens of the internet, "as a response to the decorporealized, screen-based experience of net art, claiming the world beyond either gallery or computer screen as its territory" (Tuters & Varnelis, 2006, p. 357). This point is important for the case studies of this thesis, as they require moving bodies and media experiences that do not rely on screens. I argue that this move 'out into the city' is too easily equalled with reaching out to new audiences, people in their every day contexts. The potential democratising effect of locative media (Tuters & Varnelis, 2006, p. 362) as reaching new, broader or younger audiences was also one of the initial hopes for my own research. This has not necessarily been the case as I will discuss later in the context of the case studies. Despite its often democratising drive, the reality is frequently that these projects are catering to a very elite, specialised, high-functioning niche audience - often peers of the artists. The anytime/anywhere promise of mobile media diverts our attention from the fact that gatekeepers are so crucial for access to art.

1.3 Walking as Remixing

The audience in locative art can be mobile in a variety of ways such as driving a car or taxi, cycling, taking the train, tram or underground. These modes of mobility each have their own aesthetics and specifics such as speed, scale, infrastructure or social setting. However, the majority of locative art works ask the audience to walk in order to experi-

ence the piece, and this is also the case for two of this thesis' case studies. Therefore, this section briefly considers the role of walking in locative media.[14]

In many locative art pieces, the participants need to walk in order to experience the work. The choices each participant makes in terms of direction, length of the walk, and time spent in specific locations, determine the participant's experience of the piece. Each audience member makes his or her own version, walking becomes remixing. Galloway and Ward, for example, describe how this practice is "allowing for multiple readings" of "narrative fragments [fixed] in physical space" (Galloway & Ward, 2006).

Hight (Hight, 2006) also contributes to the debate of walking as remixing in a text that focuses on locative narratives, and especially those with a historic context, on what he terms "Narrative Archeology".[15] His insistence on the role of the walking audience, and the situated experience are key aspects for my understanding of mobile sound art. If the path of the participant determines the timeline of the experience, not only the order of the locations depends on the path chosen, but also the time spent at each location or in each sound zone is up to the participants: they can choose pace, direction and duration of their walk. For his own narrative pieces Hight observes that:

> In a sense, the ultimate end-author in locative narrative is the movement and patterns of the person navigating the space. The narrative is dictated by their choices, aesthetic bias in the physical world toward certain sections, buildings or objects to move toward and investigate and their duration and breadth of movement. The narrative is composed in sections, but is edited by the movements of the person with the locative device. (Hight, 2006, p. 3)

---

14. Many text that deal with the relationship of sound, space and the body do not consider walking (Ouzounian, 2006), (Brown, 2006), but some mention it (Harris, 2006). Walking has been discussed in relation to other art genres, but mainly with a focus on the artist(s) walking, not the audience (Careri, 2001), (Araya, 2004). Walking is of course not only an artistic practice, but also a musical practice: Tap dancing, hiking and singing, bagpipes, marching bands, Flute, harp, troubadour, Samba bands and sound systems are examples - due to space constraints these cannot be explored further here.

15. Hight's text gravitates around his own piece '34 North, 118 West' (2002, with Knowlton and Spellman) that delivers the narrative via headphones while also relying on the screen of the device for displaying maps. See also p. 56 for a more detailed description of this piece.

Walking is intrinsically temporal - and the same is true for sound. Therefore mobile sound art experience is more difficult to reduce to a point or line on a map, a link, a database entry. The embodied mobility of walking, especially as articulated in public space is a key aspect two case studies of this thesis will engage with in detail, in the discussion around the art works 'Aura' (see p. 186) and 'Core Sample' (see p.216).

1.4 Wireless Art

The term 'Wireless Art' is also related to the locative and mobile art discourse because most mobile art projects rely on wireless networks (even though we also use them for static interfaces such as desktop computers these days). The history of wireless art (Kahn & Whitehead, 1992) and wireless art practice has received renewed interest with the proliferation of wireless Internet access since the early 2000s. Tuters and Varnelis argue that the free wireless movement was an important backdrop and inspiration for the locative media movement by "suggesting that ubiquitous Internet access would change our relationship with place by overlaying a second virtual world over the physical one" (Tuters & Varnelis, 2006, p. 358). This early alliance has lost some of its importance over the years; many pieces of locative art use commercial networks, and especially mobile phone networks. These have lowered their prices while data flat rates are more and more common, making them potentially even more accessible than "free" networks that might require technical skills or knowledge about their locations.

The wireless infrastructure behind networked mobile media, such as Wifi and mobile phone networks or GPS are not perceptible by humans. Part of the early attraction in locative and wireless art was to make these networks visible (Tarkka, 2005, p. 13). Rueb (2004b) argues that living in Herzian Space, or "Herzian Soup" - made up of all the different wireless networks - "alters our conventional perceptions of space, movement and interaction" (2004b, p. 2) because all the different layers of wireless networks

do not fit in with "the discrete boundaries and territories suggested by physical architecture and visually based constructions of space" (2004b, p. 2). The catalogue of the exhibition of 'Art and Wireless communication' called *Ohne Schnur* gives a good critical and historic framework for this wireless take on media art (Kwastek, Arns, & Faulstich, 2004). The 'wireless art' discourse is valuable in making the technology visible by insisting on the important role of the 'invisible' wireless infrastructure that enables networked mobile media.[16]

1.5 Status of Sound

What is the status of sound in locative art? As discussed earlier, sound is not a key concern in the locative media debate but some contributions mention sound, and there are a number of dedicated papers. Hemment describes the screen-based problems of mobile media: "in place of the richness of embodied experience of the world, many projects offer the challenge of roaming the environment while squinting at a tiny screen and clunky menu, separated from the world by a barrier of bad usability" (Hemment, 2006a, p. 351). I suggest that working with non-screen based interfaces, with haptics or sound can offer a way out of this problem. Hemment does mentions several locative art pieces that are sound-based but does not discuss the specifics of sound as alternative to visual and screen-focused modes of exploring the city. I argue that his concerns with walking,

16. Fear of this invisible radiation (Dunne, 1999) has also been mentioned in several of the interviews I conducted, but has not been addressed in enough detail to make it a substantial part of this thesis. The electromagnetic sphere has also been a concern for several mobile sound art projects. One example is Usman Haque's 'Sky Ear' (2004), where a huge colourful cloud of one thousand helium-filled balloons floated high above Greenwich Park in London. One could call mobile phones up in the cloud to listen to the electromagnetic sphere of the city while the colour of the cloud changed according to that invisible sphere. Another example for artists dealing with mobile phone radiation is 'Telenono' by Rupert Griffith (2004). It looks like a phone box but has a reverse aim: once inside the box you there is no reception. A more mobile approach to is 'BubL Space' by Elsenaar and Stolk (2002) as the website describes: “Surround yourself with soothing space. Simply press your pocket-size BuBL device. (...) Evaporate all phone signals up to three meters around” (Elsenaar & Stolk, 2002). Bartholl's 'Silver Cage' (2004) is a mobile phone bag made of a specific material so it acts like a Faraday cage, jamming reception for the mobile phone inside, also stopping any digital traces left behind (Bartholl, 2004).

embodied interaction and social context can be addressed in a different way by shifting from visual to aural experience.

Tarkka is one of the few writers that mention sonification, and not just visualisation of locative data: "Mixed or augmented reality applications use data visualisation techniques for layered representations, while the sonification of locations may produce embodied sonic experience in urban settings" (Tarkka, 2005, p. 15). She makes a case for the embodied experience that sonification allows, but does not elaborate. In the 'Leonardo Electronic Almanac' special issue on 'Locative Media' (2006) only one contribution focuses on sound and music (Gaye & Holmquist, 2006). A few other contributions mention one sound or music-related example, but do not address the specificity of sound or music: Bleecker and Knowlton (Bleecker & Knowlton, 2006) include Lalya Gaye's 'Sonic City' as the only sound example in their list of examples. Sharpe (Sharpe, 2006) mentions Teri Rueb's 'drift', and Shirvanee (Shirvanee, 2006) references Iain Mott and Jim Sosnin's 'Sound Mapping: An Assertion of Place'. Locative art is rarely discussed in digital or media art monographs, with the exception of Paul's 'Digital Art' which addresses mobile technology in a sub-chapter on "Internet art and nomadic networks", discussing several pieces using GPS and mobile phones. She is one of the few art critics also taking sound into account: "the participatory, networked creation of soundscapes is also increasingly explored through the use of “portable instruments” (Paul, 2003, p. 134) as she demonstrates with work such as Levin's 'Telesymphony' and Thomson's and Craighead's 'Telephony' that I have also discussed elsewhere (Behrendt, 2004).

Papers that are mainly or entirely dedicated to mobile sound art are mostly written by the artists, designers or researchers who made the relevant piece, and contribute a

critical discussion of their own practice. These papers will be introduced in the taxonomy chapter where these art works are discussed in more detail (p. 48ff.).

The Workshop Series 'International Workshops on Mobile Music Technology' has been a key force in shaping and defining this field of mobile music and sound since 2004, and I have been involved in organising the event since 2005. We argued that "[t]he new field of mobile music emerges at the intersection of ubiquitous computing, portable audio technology and NIME [New Interfaces for Musical Computing]" (Gaye et al., 2006). The 2008 publication *Creative Interactions - The Mobile Music Workshops 2004-2008* features many contributions (presentations, projects, performances etc.) to the field (Kirisits, Behrendt, Gaye, & Tanaka, 2008). In the introduction to this collection, me and my co-authors Gaye, Tanaka and Kirisits understand the field of mobile music as follows:

> Mobile music is concerned with the urban environment as musical interface, for location-aware sound art, audio annotation of physical space, and other creative applications. (...) Wider discussions have addressed relations between the body, space and sound, synchronicity, foreground/background activities, and the social acceptance of new behaviours in public space. (Kirisits, Behrendt, Gaye, & Tanaka, 2008, p. 7)

The forthcoming *Oxford Handbook of Mobile Music Studies* (Gopinath & Stanyek) will also be a relevant contribution, especially as it has a very wide definition of music and features several contributions dealing with mobile sound and sound art. I have discussed various pieces of mobile sound art in *Mobile Phone Music: Sound Art and Mobile Devices*[17] (2004) and elsewhere (2008, 2005, 2008, 2006).

17. Original German Title "Handymusik : Klangkunst und "mobile devices".

1.6 Arguing for 'Mobile Art'

The term 'wireless art' tends to focus on the politics of the networks used in art, the term 'locative' mainly deals with the context of the location of the art works, and - in my definition - the term 'mobile' concentrates on the mobility of the participants. I argue that the term 'mobile' affords more focus on the participant's experience, and therefore this thesis uses the term mobile art for the most part. While the fields of 'locative art' and 'locative media', as well as the wireless art discourse, have been developed since the early 2000s, the term 'mobile art' has not received the same amount of attention.

The term 'mobile art'[18] has not been used widely. It has been been used as a title for an issue of the industry-backed online Journal 'receiver' (Issue 9, 2004). One of the few papers that discuss the term 'mobile art' is by Tofts (Tofts, 2007) who equals mobile art with films that are experienced on the screens of mobile phones. His understanding of mobile art is rather bleak; he describes it as "an intimate and personalised form of popular culture that is as immediate and vernacular as take away food — something to be consumed while on the move" (Tofts, 2007). He argues that the mobility makes mobile art un-site-specific. For Tofts, art experience needs to be 'special' in terms of location and audience attention, something that the mobile context does not allows - an argument I do not agree with. As the 'locative art' discourse earlier in this chapter has shown, physical and social context are often taken into consideration in art works that use mobile devices, especially if you look beyond the 'mobile film' genre he is considering.

Though the terms 'locative art' and 'mobile art' are sometimes used interchangeably, for me there is an important distinction between them. I argue that the term 'locative art'

18. The term 'mobile art' is also used in other disciplines such as Archeology where it refers to portable artworks such as anthropomorphic figurines.

might restrict the discourse with its focus on locations, mapping practices and visual aspects. The term 'mobile art' might allow for a broader discussion of the aesthetics of mobility in media arts. To put it bluntly, the term 'locative' seems to be more concerned with ways to engage with location(s), whereas 'mobile' indicates a concern with the movement through space. Both terms are obviously related, as you move through a series of locations when you are mobile.[19]

In practice, the distinction between locative and mobile art is not one between different kinds of projects and pieces, but a distinction of perspective. While the locative perspective often focuses on (or at least starts with) the outcome, the map, the trace, the (alternative) representation of some locative activity that took place or is in progress. The mobile perspective, I argue, focuses on the *very activity* of engaging with mobile media and the urban context at once, the multi-sensory, embodied, spatio-temporal experience of the urban journey or encounter. In the definition of mobile music I developed with my colleagues, we emphasise mobile music activities that "take[] advantage of the mobile setting" (Gaye et al., 2006, p. 1). The key is that the mobile musical activities - and the participation in the mobile artworks - not just happen to take place on mobile devices, but actively engages with the mobile context. I thus define mobile art as taking advantage of the mobile context, while focussing on the mobile experience. My main interest and focus is on artworks that are not 'shrunken-down' versions of stationary media, (e.g. films) but engage with the condition of mobility. This distinction suggests that locative art has a more cartographic understanding of space, while 'mobile art' has a more ethnographic understanding of space.

19. This distinction is also made in informatics.

2. Sound Art

The term sound art, given for the artistic interest in sound, has a long tradition. The field of sound art has been growing for a while and especially the 1990s and 2000s saw an ever increasing number of dedicated exhibitions and festivals (Sonic Boom in 2000 in London, Frequencies in Frankfurt in 2002 to name but a few, see also (Schulz, 2002, p. 14)). For the German-speaking world the 352-page-volume *Klangkunst: Die gedanklichen und geschichtlichen Voraussetzungen* (translates as 'sound art: the theoretic and historic foundations') edited by Motte-Haber (1999) gave an extensive overview of theoretical and historic condition of sound art.[20] No similar compendium exists in English, but many relevant texts in English have been published as part of exhibitions and in journals, focusing on the historic aspects (Kahn, 1999), and presenting specific perspectives (LaBelle, 2006) and overviews (Licht, 2007).

Sound art is often positioned between fine arts and music, with traditions of both informing the practice. Media art is also important for the emergence of the genre. Sanio (1999, p. 105) describes sound art as being neither "solely a time art with performers nor solely a spatial art like painting or sculpture."[21] In the arts, space is traditionally the realm of fine art, whereas music is the time-related art form. In the course of the twentieth century fine art moved away from the dimension of space with performances and installations. Music moved away from the dimension of time to explore space, at least in the case of sound art installations. One of the main interests of sound art is the relation

20. There is no translation or comparable compilation in English, therefore I use some of my own translations in this text.

21. My translation. German original: "Klangkunst ist keine Zeitkunst mit Akteuren und Interpreten, aber auch keine bloße Raumkunst wie Malerei oder Plastik".

of sound to space, as opposed to music's focus on time. However, the temporal dimension of works is also part of the artist's concept.

The terms 'Sonic Art' (Wishart, 1985) and 'Audio Art' (Föllmer, 2004; Kahn, 2005) have also been used but 'sound art' is the most well-known and is used throughout this thesis. In Toop's useful definition Sound/Audio Art "explored issues of spatial and environmental articulation, the social and psychosomatic implications of sound or the physics of sound using media that included sound sculptures, performance and site-specific installation" (Toop, 2000, p. 116). Kahn (2006) questions if we still need the term 'sound art', suggesting that after the initial work that it did to recognise sound in the arts, we no longer need it. Even if we have come a long way in recognition of sound in the arts, I do not think we are yet in a position were sound awareness of artists, audiences, curators and researchers is a given, as we have seen in the locative art discussion earlier. I argue that the initial fascination with the 'novelty' of sound needed to be followed by a detailed discussion of what actually happens if sound is part of the material and form of a piece of art. The case studies in this thesis hope to contribute to a deeper discussion of these issues.

Sound art has extended the repertoire of sound used in the arts from musical sounds (tones with rhythms, melodies, harmonies and timbre) to 'any sound' including everyday and nature sounds, recorded sounds, sounds generated by purpose-built machines or devices, and computer generated sounds. John Cage has been a key figure in this process: "In 1952 Cage started from the assumption that every sound and every noise is musical unto itself" (Föllmer, 2004). He also extensively worked with concepts of 'noise' and 'silence' with '4"33' being one of the most well-known pieces.[22] Cage also

22. A mobile phone take on this is 'MyCage (Silence for Cellphone)' by Keats (2007) who "has digitally generated 4 minutes and 33 seconds of silence for cellphone" (Debatty, 2007).

"used the side effects of technical media, which are typically absolutely undesirable in music, as musical material" (Föllmer, 2004), a tradition that is kept alive with each new medium such as the use of mobile phones in sound art.

Sound art is often divided into various sub-genres such as sound sculptures, sound performances, radio art, sound installations or soundscape works. Out of these proposed sub-genres, sound performances are closest to our traditional understanding of music, with performers on a (possibly unusual) stage and a quiet (and often seated) audience. Sound sculptures could be regarded as closest to the world of fine art. They are seen as expanding the concept of sculpture by using sound as material (Look, 2005, p. 83). "[O]n the frontier between visual arts and music, an art form has developed in which sound has become material within the context of an expanded concept of sculpture" (Schulz, 2002, p. 14). One question is if the object emitting the sound is the sculpture, the sound itself or both together? Gertich (1999) defines sculptures as singular objects that emit sound whereas sound installations comprise several objects or a sound system that surrounds the listener. Föllmer's (2004) credits Max Neuhaus and Maryanne Amacher with the invention of sound sculptures. Neuhaus introduced new ways of relating space and sound: "Traditionally, composers have located the elements of a composition in time. One idea which I am interested in is locating them, instead, in space, and letting the listener place them in his own time" (Neuhaus, 1994).

Regardless of the sub-genre of sound art, many sound art pieces are highly site-specific, working with the intrinsic sonic features of a location (Sanio, 1999), the room acoustics or the soundscape, for example. For Rueb (2002) mobile sound art deals with two seemingly contradictory traditions, the tradition of site-specificity in sound art, and the focus on connecting 'any' remote spaces in telecommunications art. This tension also

becomes apparent in the case studies of this thesis, and in the framework set out in this chapter.

2.1 Audience Interaction

In mobile sound art, media interaction and sonic interaction are intrinsically linked. Interactivity has been considered in overviews of media art (e.g. Grau, 2007; Paul, 2003) and in more detail in various detailed considerations discussing historic (Huhtamo, 2000; Arns, 2004), strategic (Daniels, 2003) and networked aspects of interaction (Wilson, 2002; Corby, 2006; Mulder & Brouwer, 2007). It has also been discussed in the context of sound art. Sanio (2003, p. 14) defines sound art as interactive where "the recipient can actively engage with the event, becoming part of the aesthetical process."[23] Sanio's point is central: Interaction is not some form of audience entertainment, it is a key aspect of a work of art because it links the audience to the aesthetic process. Interaction is at the heart of an artistic concept. The complex process of audience interaction needs to be carefully designed by the artist. For Sanio (2003) the interactive play is only the starting point for the process of perception. Motte-Haber (2002, p. 33) suggests that in sound art, the form is in the action or the process, "or as a concept for a process of perception". The focus in sound art is on process, not on a result - and in interactive sound art this process is not initiated by performers but by the audience interaction.

Interaction in sound art is part of a larger move towards process and new roles for audiences in the arts. Arns (2004) describes the move from "static object" to "dynamic process" mirrored by a move from "contemplative reception to active participation". The artist is not creating an object that is aesthetic as such, but becomes the "initiator of communicative, and often also social and political, (exchange) processes" (2004). There

23. My translation. German Original: "(...)der Rezipient aktiv ins Geschehen eingreifen kann, sodass er Teil des ästhetischen Prozesses wird."

were two different approaches to change the social set-up of the audience looking at art objects created by an artist in advance. One was the move towards the process of making art in Happening and Performance, the other one was the move towards engaging the audience actively. Performance art aims to make the *process of creating the work of art visible* to the audience. The audience can see the artist in action, making fine art, more akin to music or theatre by this being a time-based performance. But it is still the *artist* interacting, the audience is in traditional role of observing, even if it is 'the making of' not the finished artwork. The second approach to changing the roles of artist and audience was more aimed at activating the audience, in Happening, for example. Allan Kaprow's Environment 'Eat' (1964) was amongst the first attempts to shift some interaction to the audience (see Candy & Edmonds, 2001) (even though most Happenings included performers and did not leave all the interaction to the audience).

The use of mobile media in sound art stands in a long tradition of artists using consumer audio technologies such as radio, tape, telephone[24] or the internet. Nam June Paik's 'Random Access'[25] (1963) and John Cage's '33 1/3'[26] (1969) for example, invite the audience to play records. A recent exhibition catalogue remarks on the way Paik uses consumer media for audience interaction: "By using contemporary media technology and the opportunity to use the art objects themselves, Paik tried to integrate the audience into the exhibition: Via an experimental Fluxus experience formed of unfamil-

24. The telephone is a traditionally overlooked example of media used by artists – as described later (see 'Musical Telephones Old and New: A Media Archaeology' p. 101).

25. There are two names for Paik's 1963 piece using record player technology. The piece consists of four piles of spinning records. The audience was invited to use a movable pick-up to listen to the spinning records and change between the different records and their grooves as they liked Internationally it is known as 'Random Access', (Pompidou, 2004, p. 308) whereas in Germany it is known as 'Schallplatten-Schaschlik' (literally: record kebab) (Daniels, 2004). Paik's similar piece using tape player technology is both in Germany and internationally known as 'Random Access' (1963).

26. For John Cage's 33 1/3 (1969) twelve amplified turntables and speakers, any 250 anonymised records, but no chairs were set up in an University venue without further instructions for the incoming audience. After a while people started playing records and thereby created the piece.

iar acoustic and visual information the audience was meant to be sensitise for new forms of art" (Nationalmuseum, 2005).[27] The role of consumer audio technology in the relation of everyday live and art experience is crucial, as will be discussed in the case study chapters.

2.2 Sonic Spatial Perception and Immersion

In mobile sound art, the audience is moving around in outdoor areas such as parks, streets, squares or the countryside to participate in a piece. Participants are immersed in the sound and media experience of the piece (in varying degrees). The relation between the audience movement in space and the sound is a key part of many artist's concepts in this field. Therefore the following section considers how the role of sound in spatial perception and the relationship between sound and the body has been discussed in the field of sound art, leading up to a discussion of sonic immersion.

Spatial perception is traditionally understood as a visual phenomenon: space is perceived with the eyes. The geometrical description of space enforces the visual dominance of space reception, as Motte-Haber (1998) observes: "In our culture the original sense of perceptual space is increasingly taken over, and thus diminished, by geometrically defined topologies, precisely because things that can be measured are more easily communicated and because they can be precisely notated on a chalkboard." Visual perception as one aspect of perceiving space is responsible for judging distances (Motte-Haber, 2002). But despite the heavy reliance on our eyes we cannot actually "see space as such. Only light reflecting objects (and only those directly in front of us) are perceptible to the human eye" as Motte-Haber (2002, p. 34) observes.

---

27. My translation. German original: "Durch den Einsatz zeitgemäßer Medientechnologie und die Möglichkeit, die Kunstobjekte selbst benutzen zu können, versuchte Paik die Betrachter in das Ausstellungsgeschehen mit einzubeziehen: Sie sollten durch ein experimentelles Fluxus-Erlebnis aus ungewohnten akustischen und optischen Informationen für neue Formen der Kunst sensibilisiert werden."

Sound art explores non-visual aspects of spatial perception, especially sonic ones. In everyday life and the art world it is often overlooked "that hearing is what gives visual space its actual plastic quality" (Schulz, 2002, p. 15). The non-visual aspects of spatial perception become more obvious in non-standard situations (as sound art tends to produce) such as darkness. We can 'feel' someone behind us and do not walk into walls (most of the time). With our ears "we can see in the dark, because the reflection of sound sources gives us information about the volume of a given space" (Motte-Haber, 1998). Motte-Haber thus questions the dominance of the visual in spatial perception: "The ear is a much better analyst of space. It conveys to the perceiver the volume of a space and gives clues about its qualities" (Motte-Haber, 2002, p. 34). Toop (2004, p. 47) makes a relevant connection between acoustic spatial perception and atmospheres: "We hear space all the time, not just its echoes and foreground signals but also its subliminal undertow, the presence of atmosphere." What we hear has an often underestimated impact on the atmosphere of places as well as on our mood, as the use of Muzak (Lanza, 1995) and the Walkman (Bull, 2000) illustrate.

Sound always travels over space in time, emanating from the source, distributed over space and eventually fading. The source of a sound is always an object that takes up space, but the sound itself is not an object: it only travels through space over time without actually taking up any space itself. Sound is immaterial. Sounds are essentially time-based, there is no sound without time. Every sound is ephemeral: "One of the essential qualities of sound seems to be that it’s fading" (Look, 2005, p. 89). And Rueb suggests "that sound allows: A space that’s more permeable and doesn’t suggest the same kind of hard and fast boundaries of a visual construction of space" (Breitsameter, 2004).

Sound's relation to space and time is different to the one in the visual world of objects we see with our eyes. Sound as an "object of sensual perception [...] differs fundamentally from visible and tangible things that can be grasped from a distance as discrete objects" (Look, 2005, p. 89). We are immersed in sounds. If we look at objects we perceive space as being empty, only being "decorated" with objects. But actually the invisible, see-through space is full of sounds, and we are surrounded by it. "The eye creates distance; the ear puts us at the centre of a dynamic energy-filled realm. In our visual culture, space seems like an empty box", as Schulz puts it (2002, p. 15). Rueb summarises key aspects of sonic perception:

> Sound presents us with a world in which hard and fast boundaries do not exist. We cannot clearly distinguish the edges of a sound as we might with objects and physical spaces. Sound is mutable, fleeting and ephemeral. It bleeds, it leaks out, it attenuates and disappears. Sensually vibrant and immersive, sound is almost tangible, yet ultimately invisible. Yet for all its elusiveness, sound is everywhere and all encompassing. Unlike vision, which demands the proper orientation of our frontally located eyes, we hear sound with our whole bodies, not just with our ears. (Rueb, 2002)

As Rueb mentions, our ears are not the only part of us that perceive sound. A crucial element of the body-sound relationship is that sound permeates the body, entering the ears but also through the body. Toop states: "We hear, not just through the ears, as a conscious activity, but through the whole body, in a mixture of fully conscious, peripherally conscious and unconscious awareness" (2004, p. 47).[28]

We are not able to shut our ears as we can do with our eyes, but at the same time we have a well developed ability to block out unwanted sounds. We can focus our attention towards certain sounds and shift our attention between foreground and background sounds. For example, either listening to the person next to us in a noisy cafe or to the music played in the venue. At other times it seems impossible to shift our attention

28. When considering the body-sound relationship it should not be forgotten that sound and music are not only pleasurable, they can also be painful, and can be used as weapons (Bain, 2005).

away from a sound that is annoying us, a clock ticking at night, for example. Sound artists often engage with this economy of acoustic attention, for example by aiming to shift our attention towards unusual, 'neglected' or unwanted sounds. The case studies of this thesis also engage the audience in shifting their attention between the soundscape the artist and/or participants overlay onto the locations and the existing soundscapes.

The ear also perceives motion; this is important for the perception of moving through space: it "makes conclusions about space based on temporal processes whenever noises are present" (Motte-Haber, 1998). Vicinity, close surroundings are perceived by haptic-kinaesthetic perception. Non-visual perception is furthermore vital for the perception of one's body positioned in space. Sound's role is not only interesting in perceiving the motion over other objects and people, but also in relation to our own mobility. "For perception in general and for perception by the ear in particular, however, it matters whether we are standing, sitting, or walking. Thus we feel kinaesthetic stimulations that provide clues to positions in space. Of course, this also plays a role in sight." (Motte-Haber, 2002, pp. 33-34). Motte-Haber's argument is highly relevant for mobility. As artists have to take into account the influence of mobility on reception; they can play with it, like Akitsugo Maebayashi's 'Sonic Interface' (1999) that works with small changes to have a big impact on our perception. When you walk around town with 'Sonic Interface' you listen to your surrounding sounds with a delay of several seconds via headphones and this causes severe problems in orientation and therefore in navigating urban space.

2.3 Immersion and Critical Distance

Discussions of immersive technologies and their histories are also primarily focused on the visual aspects of immersion (Huhtamo, 1995; Grau, 2003; Bartlem, 2005). What about aural immersion? Bartlem (Bartlem, 2005) explores differences and similarities of immersive and distributed aesthetics. Similarities are: "interests in transforming and extending notions of the body and perception through technological mediation." She explains how we experience immersion as the "sensation of being present in an electronically mediated environment" and immersive artworks "have the capacity to collapse the perceived distance between the viewer and the artwork or between remote participants" (Bartlem, 2005).

Bartlem (2005) argues that the Cartesian split between mind and body is also dominant in many traditional discussions of art and art theory - and I argue also in music and music theory. "Modern aesthetic philosophy has often struggled to account for sensory-aesthetics in the body of the spectator" thereby prioritising thought and reflection over feeling and perception, as Bartlem states (Bartlem, 2005). Therefore the ideas of critical distance often seems to be difficult to combine with the idea of immersion. The author argues that in immersive artworks the critical reflection takes place at the same time as the immersive experience - "while one is engaged in the act of play or interaction within the immersive environment" (Bartlem, 2005).

Bartlem states that the concept of the 'distant observer' in traditional aesthetic theory does not work in immersive media art. I extend this argument for sound art. In a paragraph about the difference between oral and literary cultures, Walter Ong writes: "Sound situates man in the middle of actuality and in simultaneity, whereas vision situates man in front of things and in sequentiality" (Ong, 2000, p. 128). In relation to

screens and computers this is also interesting for mobile technology where we do not stare at the screen motionless, but we are embedded in technology, carrying a potential and actual bubble of connectivity with us, and it is very much an audio technology (Look, 2005, p. 89).

Dyson also mentions "concern[s] regarding the eradication of aesthetic distance that 'total immersion' encourages" (2009, p. 3) in her discussion of new media rhetoric as being very much based on the rhetoric of sound - without critical awareness of this. Especially new media art, she argues, "seem[s] to aspire (...) to the conditions of sound" (Dyson, 2009, p. 3). For her, "sound is the immersive medium par excellence" and she elaborates: "sound returns to the listener the very same qualities that media mediates: that feeling of being here now, of experiencing oneself as engulfed, enveloped, absorbed, enmeshed, in short, immersed in an environment" (Dyson, 2009, p. 3).

How does immersion work in locative and mobile art, where we are both 'here' and 'there' in hybrid spaces? The visual focus in the arts world often implies a distant observer - this does not work for sound and telepresent digital art as these rely on immersion, not distance. In mobile sound art, the participants are immersed in sound and media while at the same time they are busy navigating their urban environment and experiencing it in new ways. This might suggest that the tension between immersion and critical and aesthetic experience is made productive in those works.

3. Public and Dialogical Art

This section of the framing chapter addresses the context of public art, especially the dialogical aspects of what is known as 'new genre public art' (Lacy, 1995), discussing how social public art might be able to connect artists and audience in alternative ways (Maksymowicz, 1992). The discourse on various aspects of public art and new genre public art is vast (Mitchell, 1992; Miles, 1997; Acconci, 2004), and especially Kester's concept of 'Dialogical Art' provides contexts for mobile sound art and allows questions to be formulated that have not been covered by the sections on locative and sound art.

3.1 Distracted Publics

The hope of mobile and locative art is often to occupy everyday spaces and times, whereas more traditional art would have relied on both a dedicated time and space. Mobile and locative art are of course not the first art genres hoping to inhabit everyday contexts; they stand in a long tradition of public art - and share with it the tension between mundane everyday spaces and times and the aesthetic experience: "A museum is a 'simulated' public space; it's auto-directional and uni-functional, whereas 'real' public space is multi-directional and omni-functional," as Acconi argues (2004, p. 29). Most of the time we are already busy with several activities in public space, e.g. catching a train or crossing the street, whereas in the museum the focus is mainly on one activity, experiencing art. Moreover, in addition to the traditional "multi-directional and omni-functional" public space experience, we are now faced with yet another layer of directions, functions and focus, in the form of the networked and mediated layer of phone calls, ipods and social networking sites. Here, a useful distinction can be drawn since traditional public art has been concerned with engaging with the physical public space, whereas locative and mobile art is mainly, or additionally concerned with engaging with

the networked layer. One could argue that the distractedness of moving around in public space has increased in the age of mobile devices and constant connectedness. The museum space, cleared of all coincidences, without much wandering of our attention becomes unusual as Schmidt-Wulfen points out - today the "distracted gaze" is normal (Schmidt-Wulfen, 2004, p. 416).[29]

Acconi argues that "[a] museum is a 'public place', but only for those who choose to be a museum public" (2004, p. 29). By inverting one part of his argument, I argue that in a similar way, with mobile art, any public space can be a site for an art work, but only for those who choose to engage with the work. To experience mobile art in public space you need to know about its existence in the first place and then choose to participate in the art work. Potential audiences also need to have the technical skill to access it, and of course have the cultural capital to want to spent time experiencing art. Mobile and locative art often claims to be inclusive just by the use of everyday mobile devices, refusing to acknowledge how excluding it often is.

3.2 Dialogical Art

Kester's concept of 'Dialogical Art' extends the argument I made in the earlier section on sound art, where I discussed how the interaction with a piece starts the process of perception and thereby establishes the piece itself (see p. 32ff.). In his 2004 book *Conversation Pieces: Community and Communication in Modern Art* Kester develops his concept of a 'dialogical aesthetic' in which he argues how an open-ended process, a facilitation of communication can be an art work; how the work is produced through the process of communication. He links the public art discourse around 'new genre' and 'community-based' public art with theories of communication. His concept draws on the

29. He is of course talking about the visual gaze, but a similar argument can be made for the 'auditory gaze'.

avant-garde tradition of opening the audience to new experiences while he also insists that art does not have to be difficult or shocking. One of Kester's key arguments is that accessible art does not equal simplistic art: He argues that puritan work ethic is at work in the idea that art is difficult and needs education and effort to be understood, and the reward for the hard work is the understanding of the art (Kester, 2004, p. 44). The art-works he considers focus on process, not a single shock moment - and this process is about communication. He is interested in the way these works curate successful communication, not failure of communication (Kester, 2004, pp. 8-9). Kester diagnoses in both modern and postmodern avant-garde, a resistance to dialogical art, to "shared discourse" which he discusses in interesting detail (Kester, 2004, p. 85). Dialogical art is often dismissed by critics because they (quite literally) look at the wrong thing, literally in terms of 'looking', and 'thing'; "dialogical projects, in contrast, unfold through a process of performative interaction" (Kester, 2004, p. 10).

Kester suggests an identity concept where identity changes over time, and art can be one way to initiate change. People have different levels of willingness to allow this (Kester, 2004, p. 77), which in turn depends on education amongst other things. "Empathetic identification" means that although we cannot be sure that another person has the same experience as ourselves, we can tell roughly from their reactions. The notion of 'empathy' links identity and community discourses in Kester's concept as the process of empathetic identification initiates a group process: "contingent and locally defined, solidarity based shared identification", leading to "provisional alliances" (Kester, 2004, pp. 77-78). He suggests that "unexpected insights achieved via collaborative interaction produce new forms of subjectivity" (Kester, 2004, p. 122). The artist's empathy is also a necessary part of dialogical art but at the same time there is also a danger that this empathy "den[ies] the real social differences that exist between artists

and their collaborators" (Kester, 2004, p. 150). Kester also criticises the "reductive belief that discursive exchange or dialogue has the power, in and of itself, to radically transform social relations" (Kester, 2004, p. 182). He also insists that the different power relations of different audiences, and between artist and audience can not be eliminated (by the work), and the political violence of discursive forms cannot be overlooked (Kester, 2004, p. 182).

I have sympathy with Kester's view but how can his concept of dialogical art fit with 'locative art' and more specifically mobile sound art? The relationship between communities and artist has also been discussed in the locative art discourse, where many pieces provide platforms for the audience to contribute to the piece via their mobile devices (as presented in the first part of this chapter). Tarkka has a critical stance on these 'platform' pieces: "artists increasingly operate as *service providers*: their work becomes that of a building platforms for user participation and collaboration, and of *maintaining* and *moderating* communicative situations" (Tarkka, 2005, p. 11) [emphasis by the author]. As with other fields of art that engage with communities, one could argue that community-based locative art is often more beneficial to the artist than to the community, some even go as far as to suggest that artists often exploit communities. In the light of current debates around 'immaterial labour' or 'prosumers', one could argue that contributing to a piece of (mobile) art, is a voluntary and un-waged contribution to making the piece. Tarkka observes: "Perhaps fittingly, the usual metaphor in geolocated messaging concepts is that of ‘post-it’ notes: the fetish of teamwork and brainstorming - of digital labour now made ubiquitous" (Tarkka, 2005, p. 10).

This tension between enabling and empowering on one hand, and exploitation and unwaged labour on the other hand - this tension has to be negotiated by each mobile media artwork. Kester's concept of 'dialogical art' allows one to pose critical questions

in researching the ephemeral, often non-talking micro communities that last for the duration of shared interaction with the art work.

3.3 Multi-Sensory Dialogues

Kester identifies two main shortcomings and thus future avenues for research onto public art as dialogic in his analysis - the multi-sensory and the digital media aspect. I argue that conversational art practice becomes even more interesting where Kester's argument stops, which he acknowledges: "dialogical works are not just visual but aural and tactile as well" and he also mentions the "creation of a mis-en-scéne for dialogical interaction that is as much spatial as visual" (Kester, 2004, p. 189). Kester credits media art in a single sentence without engaging with "recent digital media theory and practice" any further (Kester, 2004, p. 189). I make his account productive in the two ways he pointed out, the multi-sensory and the digital. The move from object to process, from single moment to ongoing engagement, understanding "aesthetic experience as durational rather than immediate" (Kester, 2004, p. 12) resonates with the locative art and sound art discourse discussed earlier in this chapter.

The case studies in this thesis offer a time and space for interaction and communication. The idea is often to change people's perception of themselves, and their surroundings - but not in a patronising or 'shocking' way, rather as a dialogical process that takes time. Both 'audience' and artist(s) are involved in this process, and all parties are changing, including the artist. Listening and empathy is also at the heart of Kester's dialogical concept (Kester, 2004, p. 114). Listening is active and knowledge producing, for researcher, artist, audience. I extend this concept of listening by engaging all our senses to emphasise the embodied, situated, contextual knowledge that is often overlooked in contemporary Western societies and aesthetics. Following on from the idea that participating in these works can produce knowledge, we can look at what sort of knowledge

that is, at "the kinds of knowledge aesthetic experience is capable of producing" (Kester, 2004, p. 9). If art is a way of producing knowledge, the arguments are not rational or textual; they are emotional, sensual, complex. They are about perception, body, emotions, not only about the mind.

Kester does not talk about mobility though it features in several of his key examples that use a boat, cars, and buses (Kester, 2004, pp. 1-7). I suggest that there is a link between art and travelling in its supposedly transformative potential. Travelling is supposed to make you more empathic, and is also often understood to help you understand or 'find' yourself. Odysseus was "travelling through different worlds of otherness" (Kester, 2004, p. 119). The trope that is still current today is to make your own narrative of life, by encountering art and travel. Kester emphasises that encountering 'the other' requires openness as condition, not as a result (Kester, 2004, pp. 118-123). Possibly, participation in mobile sound art can be conceptualised as a miniature travel experience that allows one to travel through an 'other world' in familiar surroundings by adding a sound layer.

4. Conclusion

While the debate around locative art has been mainly framed by visual discourse and especially cartography, its engagement with media art in everyday contexts has provided a relevant antecedent for mobile sound art, as the first section of this chapter evidenced. Drawing on the locative art discourse has allowed me to distinguish between 'traces elsewhere' and 'experience in-situ', and to consider the importance of the social context, the role of walking as remixing, and the status of sound in locative art. Finally I have argued that the term 'mobile art' is more productive in discussing the embodied, experiential and trajectory aspects of mobile media art experience.

The second part of this chapter discussed key aspects of sound art, arguing that the tension between immersion and critical distance is especially intriguing in mobile sound art. The critique of a linear understanding of time and a Cartesian understanding of space, suggests that a focus on performed, situated and embodied experience can offer alternative ways of conceptualising mobile media experiences and practices. "The sonic dimension provides a rich arena in which to explore alternative, non-linear constructions of space and time" (Rueb, 2002).

Part three of this chapter discussed Kester's concept of 'dialogical art', testing out how this concept could work in the context of a media-distracted public, and when taking into consideration multi-sensory aspects of dialogic interaction.

I close this chapter with an observation by Seijdel (2005): The rich literature around public art rarely mentions sound while the growing body of research around sound art is mainly concerned with the gallery or museum setting. This is surprising, as Seijdel remarks: "after all, public space is manifest not only visually, but also, and to a considerable extent, acoustically: its public nature hinges on visibility as well as on audibility. All the same, the accent in cultural or social analyses of the public space still often rests on the visual" (Seijdel, 2005, p. 4). The sounds of the everyday context differs from the ‘silence’ of a concert hall or the often quite sound proof environment of museums or galleries. When taking place in a public urban environment, works of sound art are challenged with exactly the same as we are in our daily routines: traffic noise, conversations, Muzak, iPods, ringing mobiles, birds, advertisements, etc. Mobile phones and the iPod have had a profound impact on our (sonic) relationship to urban space, both as contributors to the soundscape and in the way our perception of this very soundscape is changing with mobile media.

One of the very few texts considering sound art in public space, Föllmer's 'Organising Sound in Public Space' (1999)[30] has a hopeful argument concerning the role of public (sound) art: it enables participants to perceive public spaces as meaningful and interaction with art resonates back into everyday life. Föllmer states that "art in every day life effects every day life" (Föllmer, 1999, p. 226)[31] and that "sound art in public places provides/sets the conditions for a space for social encounters" (Föllmer, 1999, p. 226).[32]

Drawing on the discussion of these antecedents of mobile sound art, taking into account how critical writing on the field has been constructed, the next chapter of this thesis develops my own taxonomy of mobile sound art.

30. My translation, original text and title in German: 'Klangorganisation im öffentlichen Raum'.

31. My translation.

32. My translation. German Original: "(...) schafft Klangkunst im öffentlichen Raum die Vorraussetzung für soziale Begegnungen".

II. A Taxonomy of Mobile Sound Art

This chapter develops a taxonomy of mobile sound art. My taxonomy consists of four key categories - 'placed sounds', 'sound platforms', 'sonified mobility' and 'musical instruments' and is formed through a survey of 200 mobile sound art works. The work of collecting and documenting these works developed over the period of the thesis, and also draws on previous research carried out since 2001. While not exhaustive, it nonetheless provides a substantial corpus with which to develop a taxonomy. My taxonomy also draws on the antecedents and the different debates around the field that have been discussed in the previous chapter. There are no existing taxonomies of mobile sound art. Creating a taxonomy advances the description of mobile sound art by developing a suitable vocabulary to differentiate works. While classifications necessarily simplify the specifics of each work - which is problematic - this also makes it possible to relate works to each other and draw out key aspects across a number of artworks (see Kwastek, n.d.).

Each category of my taxonomy groups together a number of pieces that share the characteristics as defined below. In this chapter, to give a sense of each category, I choose several examples from my archive and discuss them. I have then picked case studies that investigate these different taxonomic groups but I have not attempted to make the case studies representative of the whole of each taxonomic group. These sustained case studies are reported in the later chapters of this thesis. A timeline containing all examples of artworks mentioned throughout this chapter and the entire thesis is also provided at the end of the chapter (see p. 77).This timeline also functions as an index to finding the relevant pages where each artwork is discussed in this thesis.

1. Placed Sounds

In this 'Placed Sounds' category of mobile sound art artists curate the distribution of sound in space and participants create their own version or remix of the piece by choosing their path through the sounds. The sounds and their locations are chosen by the artist and the participants experiences their own version or remix of the piece, depending on their path and the time spent with the piece. This category consists of works where the artist curates sounds in public outdoor spaces and the audience experiences these works *in situ*. This general idea has been introduced in the section on locative art in the previous chapter, where I argued that movement (often walking) acts as remixing. In locative art all sorts of media are distributed in space - in mobile sound art the main or entire focus is on sound. Although many set-ups are possible, recently many artists have chosen to work with GPS to locate sounds in space, and these form the core of this category.[33]

This category encompasses a series of 'themes'. One emerging theme in this category is a historic perspective, overlaying a location with sounds and/or narratives of its history. Another emerging theme are spatialised fictions, where an (existing or new) narrative is set in a specific physical location. Other projects have neither historic nor narrative connotations and experiment with specific qualities of sounds in space. Before discussing several examples in more detail, I draw out connections between the mobile sound art category 'placed sound' and previous practices in sound art.

In sound art, the sites chosen for the distribution of sounds have often been indoor locations such as rooms or buildings with the forms of control these environments provide. Sounds have often been emitted from physical objects or from speakers. Less

33. A different area where 'placed sounds' have been used for many years is the field of touristic audio tours and museum guides, which is not discussed further in this thesis.

often, but none-the-less with sustained interest (see Föllmer, 1999), this strategy has been taken outdoors and into public spaces by artists in many different ways: from hanging wind chimes in trees ('Spoonbridge and Cherry' by Pierre Huyghe, Minneapolis 2009) to hiding speakers in ventilation shaft of the New York subway ('Times Square' by Max Neuhaus, New York City, 1977), and to indicating locations for listening with marks on the pavement ('Otodate' Akio Suzuki, 1996) to name but a few. Other artists such as Christina Kubisch have worked indoors with headphones for the audience to listen to sounds. Christina Kubisch has used electromagnetic induction since the 1970s, stringing electronic wires across rooms; the audience walking around with wireless headphones, hearing specific sounds or mixtures of sounds depending on their location. Her piece 'Oasis 2000: Music for a Concrete Jungle' (2000) is set on the roof top of a London gallery where the audience listens to "noise zones of rainforest, babbling brooks and bird noises [...] to wry effect given the gallery's overwhelming concrete presence" (Brown, 2000). Kubisch comments on the role of the audience in her magnetic induction pieces: "The visitor becomes a 'mixer' who can put his piece together individually and determine the time frame for himself," (Kubisch, n.d.) chiming with the argument I made in the section on locative art about the walking audience as remixing pieces.

Another tradition from sound art that is relevant for the category 'Placed Sound' is the overlaying of one soundscape with another one. This has been one of several leitmotivs in (public) sound art and this 'translocation' (Föllmer, 1999) of soundscapes has been continued by artists using the Internet. Now, this networked component is entering our cities with connected mobile media. Artist-curated sound spaces for the audience to explore with headphone have been developed in sound art for several decades. The Walkman and GPS technology have been important - but not the only - media in this

category. Headphone[34] walks often take place in public space and the audience listens to an added audio layer via headphones. Schätzlein's taxonomy[35] of the Walkman (or rather any mobile audio players) in sound art (Schätzlein, 2001) includes artists who produce tapes with narratives, sound or music for Walkman listening; often guiding the listener through unfamiliar urban territory. Other artists have created tapes to be listened to while walking around museums or galleries, used the radio function of the Walkman in combination with local broadcasting, or asked the audience to use the recording function of the device.

1.1 Key Examples

This section discusses examples of the 'Placed Sounds' category of mobile sound art that work with GPS (for the most part), mainly with established artists and their exhibited works, but also naming some lesser known pieces. The field of GPS sound projects has been developing since the late 1990 and GPS has become increasingly popular over the last decade. In the early days the artist faced a number of technical challenges and had to develop custom hard- and software, as there were no off-the shelf solutions available.[36] Over time, the location-based technology has developed and become part of consumer media, making the relevant technology much more ubiquitous and accessible. Nowadays, GPS units and interfaces are not additional devices or require programming skills; they are integrated into existing devices such as mobile phones or cameras while the relevant data integrates with existing software.

---

34. See Sterne (2003, pp. 154 – 177) for a historic account of headphones.

35. Schätzlein's two main categories are 'Walkman Technology' - with the sub-categories 'Tape Walkman', 'Radio Walkman', 'Hybrid Walkman' and 'Wireless Headphones' (each again with further sub-sections) - and 'Walkman Aesthetics - with the sub-categories 'Fictional Audio' and 'Wireless Headphones' (each again with further sub-sections). [my translation, original text in German].

36. See also the relevant discussions in the chapter 'Polyphonies of Footsteps' (p. 186ff.) and in the chapter 'Rhythmanalysis. Lefebvre on a GPS Sound Walk' (p. 216ff.).

There are a number of artist that have been at the forefront of exploring 'placed sound' pieces with GPS, and regardless of who was the earliest, they all developed a distinctive style. The case study from this category that will be discussed in more detail later is Teri Rueb's 2007 work 'Core Sample' that places sounds that evoke the history of the location to the elevation profile of a Boston Harbour Island. Teri Rueb has worked with GPS and sound in her work (see Rueb, 2004b) since 1999. 'Trace', Rueb's first GPS piece, was located on the hiking trails surrounding the Banff Centre in the Canadian Rocky Mountains. Another of Rueb's GPS sound walks, 'drift', was exhibited in Cuxhaven (Germany) in 2004 where it was part of the exhibition 'Ohne Schnur'.[37] In this piece the placed sounds moved in and out with the tides (Rueb, 2004a). In 2009 she developed 'Elsewhere: Anderswo' in Neuenkirchen, Germany.

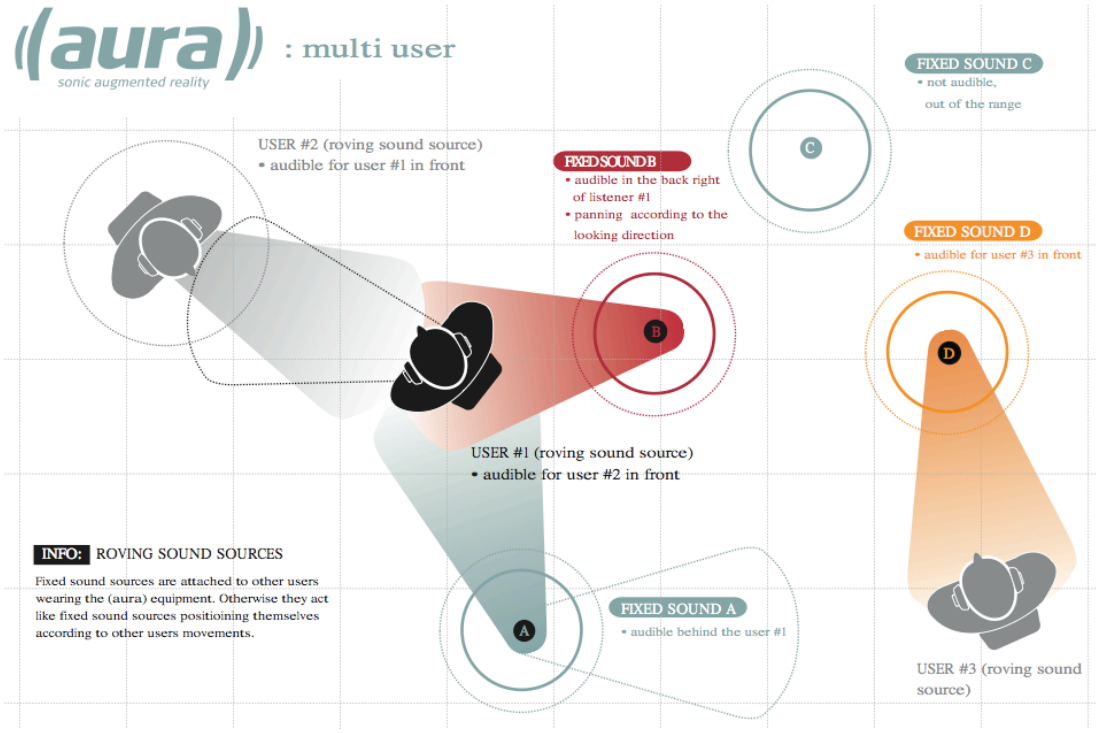


Figure 1: 'Aura. The stuff around the stuff around you' by Steve Symons (2004)

Another artist that has been active in this category 'Placed Sounds' is Steve Symons. His 2004 piece 'aura. the stuff around the stuff around you' (2004) was a GPS-based

37. where I participated in the sound walk.

sound project, shown at futuresonic[38] in Manchester (see figure 1, page 52 and (Symons, n.d.).[39] The piece is described by the artist as follows:

> aura rejects visual interfaces (mouse, keyboard, screen) in favour of directional augmented reality using 3-dimensional sound to create a seamless, naturalistic experience, (...) full sonic augmentation of real space. Walking through the designated space wearing headphones and carrying an aura roving unit (Personal Digital Assistant [PDA] programmed to access user location and heading) provides full spatial listening. (Symons, 2004)

Many of Rueb's and Symon's pieces are examples of more abstract works in the category of 'Placed Sounds'. Other artists, such as Schemat, have worked in more narrative or fictional ways.

Stefan Schemat claims on the website of the 'Ohne Schnur' exhibition that his 1999 work 'Berlin Alexanderplatz 5.0' was the "First GPS-based writing-project with spatial sounds" and his 2000-2001 work 'Infection' to be the "first walkable novel" (Schemat, 2004). At 'Ars Electronica' 1999 he and his fellow artists Isabella Bordoni, and Roberto Paci Dalò won an 'Honorary Distinction' in the category 'Interactive Art' for their work 'Augmented Reality Fiction'. The artists Schemat et al. explain that 'Augmented Reality Fiction':

> makes it possible to represent the stories connected with a certain place directly on location. In this way the story of the released prisoner Franz Biberkopf in Döblin's Berlin Alexanderplatz can be experienced in Rosenthal, on the outskirts of the city, at the location where it took place in the novel. (...) [T]he energy and speed of movement are registered and thus interactively control the acoustic event, which becomes more hectic or calmer accordingly. (...) [The piece] can make use of are mobile and static sounds and 3D sounds, which are used for orientation and navigation. (Isabella, Paci Dalò, & Schemat, 1999)

38. where I experienced the piece.

39. One of Symon's more recent pieces, 'aura. the stuff that forms around you' does not fit onto this category, but falls into the category 'Sonified Mobility', as outlined below and is one of the case studies discussed in its own chapter ('Polyphonies of Footsteps' (p. 186ff.).

At 'Ohne Schnur' in 2004 Schemat showed the piece 'Wasser' (or 'Water'). His pieces fall into the genre of what I call spatialised fiction, setting fictional narrative in specific locations, for the audience to explore by walking and listening.

Janet Cardiff is one example of how artists have made connections between physical locations and their layer of sound without networked media such as GPS. Cardiff's audio walks are three-dimensional audio reproductions created by using binaural recording technology. For her 2004 'Her Long Black Hair', she used a combination of Walkman narrative and sound plus photographs to guide the listener through central park in New York City, taking "on a winding, mysterious journey through Central Park's 19th-century pathways, retracing the footsteps of an enigmatic dark-haired woman" (Cardiff, 2004).

Another spatialised fictional piece using GPS is 'Craving' by Bernhard Garnicnig and Gottfried Haider (Vienna, 2008). The artists selected fragments from a a theatre play and placed them into space. There is no map to guide the walk, and in addition to location, head and body movements influence the sounds and make them locatable in space (figure 2, page 55). The sounds are rendered out in real-time (Garnicnig & Haider, 2008).[40]

40. I experienced this piece in Vienna in 2008.

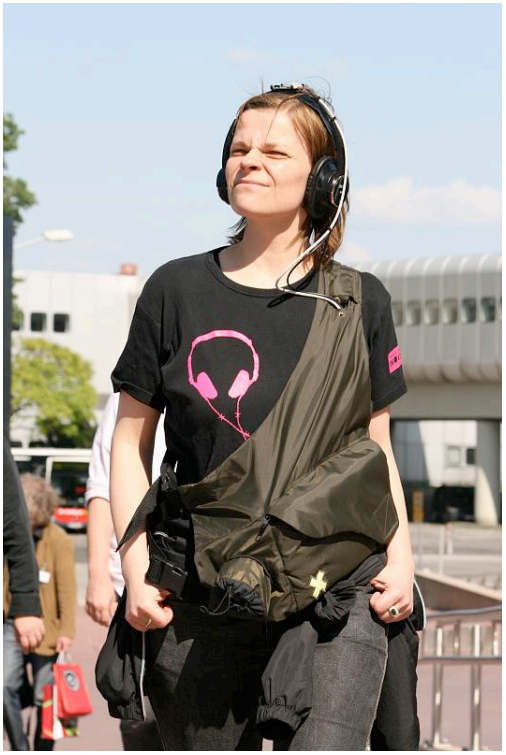


Figure 2: 'Craving' by Garnicnic and Haider, Vienna, 2008

Another narrative GPS sound project is 'InterUrban' by Jeff Knowlton, Naomi Spellman and Jeremy Hight in Manchester (figure 3, page 56).[41] 'InterUrban' is:

> an interactive narrative that unfolds according to the visitor's movement. It runs on a Tablet PC with headphones and GPS card. Environmental factors such as Listener location, the distance travelled by the Listener, time of day, heading, and proximity to hypothetical or historic events determine how the narrative is constructed. (Futuresonic, 2004)

41. I experienced the piece at Futuresonic 2004 (Manchester).

Figure 3: 'InterUrban by Knowlton, Spellman and Hight 'in Manchester, 2004

This group of artists (plus Brandon Stow) (Hight, 2006), also developed the piece '34 North 118 West' in 2002 (Knowlton, Spellman, Stow, & Hight, n.d.). Like 'interurban' the piece also and "plays through a Tablet PC with Global Positioning System card and headphones. GPS tracks your location to determine how the story unfolds as you uncover the early industrial era of Los Angeles."

Whereas 'InterUrban' was a fictional piece, this earlier work was historic. A further example for a historic/oral history GPS sound projects is 'Penninsual Voices', a 2006 piece by Daniel Belasco Rogers (Rogers, 2006): "Peninsula Voices is a sound walk using GPS and handheld computer devices, that lets you explore the Greenwich Peninsula in a different way. As you walk around the streets you hear the voices of people and their stories in the places where they happened." 'Penninsual Voices' deals with the local histories, people's stories, in a similar way to the work 'murmur' that will be discussed in

the next category. Another placing of historic sounds is 'Hidden Histories', a recent (2008) work by Armin Medosch et al that uses "wireless communication technologies such as Wifi and Bluetooth in combination with FM radio to create listening stations where stories from Southampton's Oral History Archive are broadcast through a low range FM radio signal" (Medosch, n.d.) - one of many pieces using alternatives to GPS.

Many recent examples in this category 'Placed Sounds' have worked with GPS and artists have developed a rich repertoire of curating sounds in urban and rural spaces. Several sub-genres have evolved, including historic narrative, spatialised fiction and more abstract sound experiments. Specifics of this category of mobile sound art will be analysed in detail in the case-study chapter around the piece 'Core Sample' by Rueb (see p. 216).

2. Sound Platforms

A second category 'Sound Platforms' gathers together mobile sound art works where a specific platform is provided for the audience to contribute, edit and place sounds in space. Compared to the previous category where artists were placing and curating sounds in space, this second category affords a different kind of interaction: The audience needs to choose or record sounds and assign them to locations. They can then listen to the collaborative outcome of all these contributions, sometimes in a similar way the artist-placed sounds of the first category are experienced. Here, the way the platform is designed is crucial, as it frames the interactions and contributions of the audience. Pieces in this category arguably ask quite a lot from the audience since the pieces rely on active and contributing individuals and communities. For this reason perhaps workshop settings - where the audience works in groups and over time to contribute to the piece - are often used by the artists. I argue that these curated and time-limited

events that engage with these platforms are often more successful than an open-ended 'anyone can contribute anytime' set-up (see also p.175 ff.).

Traditions for this category can be found in networked art and net.art where artists have designed platforms for the audience to contribute text, images, videos or sounds. More narrowly this also includes net.audio (see Föllmer, 2005a, 2005b). The Internet and especially the more recent developments of what is often termed web 2.0 with its social networking sites, is partly built by contributions of the participants too. At the mainstream end of what is possible with mobile media are mobile versions of networked platforms with the economic potential of location-based advertising (Mitchell, 2003) and mobile gaming (Finn, 2005; Hjorth, 2007; Souza e Silva & Hjorth, 2009). Artists who design platforms often have other motifs, often aiming to engage the audience with their surroundings in creative and critical ways (as always, the commercial/ non-commercial aspects are not entirely divided in all cases).

The mobile sound art category 'sound platforms' invites the audience to engage with the existing soundscape of a specific location, asking their creative input in working with their own sounds in this context. The - often collaborative - result of these audio interventions or additions are then experienced as an auditory stream - either by headphones or by speakers.

To understand how this category of mobile sound art plays out in a variety of ways, I discuss several examples, structured along three themes that emerge in this category: sound placed in public, narrative projects and speaker projects.

2.1 Key Examples

The first three examples provide a platform that allows the audience to place their own sounds (from soundscape recordings to music) in public spaces, each in a specific way. An early example is 'Hear&There' by Joey Rozie, Karrie Karahalios and Judith Donath (1999). The piece "allows people to virtually drop sounds at any location in the real world" and later on people "using the Hear&There system will be able to hear these sounds" (Rozie, Karahalios, & Donath, n.d.). 'Audio Graffiti' by Chia-Ying Lee (2006) translates the visual practice of graffiti into a sonic one where participants leave audio tags (such as music loops) in their urban environment and these can later be listened to through a player software while walking past.

An example I discuss in more detail is 'Tactical Soundgarden Toolkit' (in the following referred to as 'Tactical Soundgarden' or TSG). Participants of this 2006 work by Mark Shepard walk along the streets, headphones on, looking like all the other ipod users around them, but are not listening to music of their choice, they are listening to sounds other people have planted in the streets. As they approach the sounds they get louder, they can walk around the sounds and can decide to 'prune' them. These sounds are plants in a 'Tactical Sound Garden [TSG]', by Mark Shepard. The project "draws on the culture of urban community gardening to posit a participatory environment where new spatial practices and social interactions within technologically mediated environments can be explored and evaluated" (Shepard, 2008a).

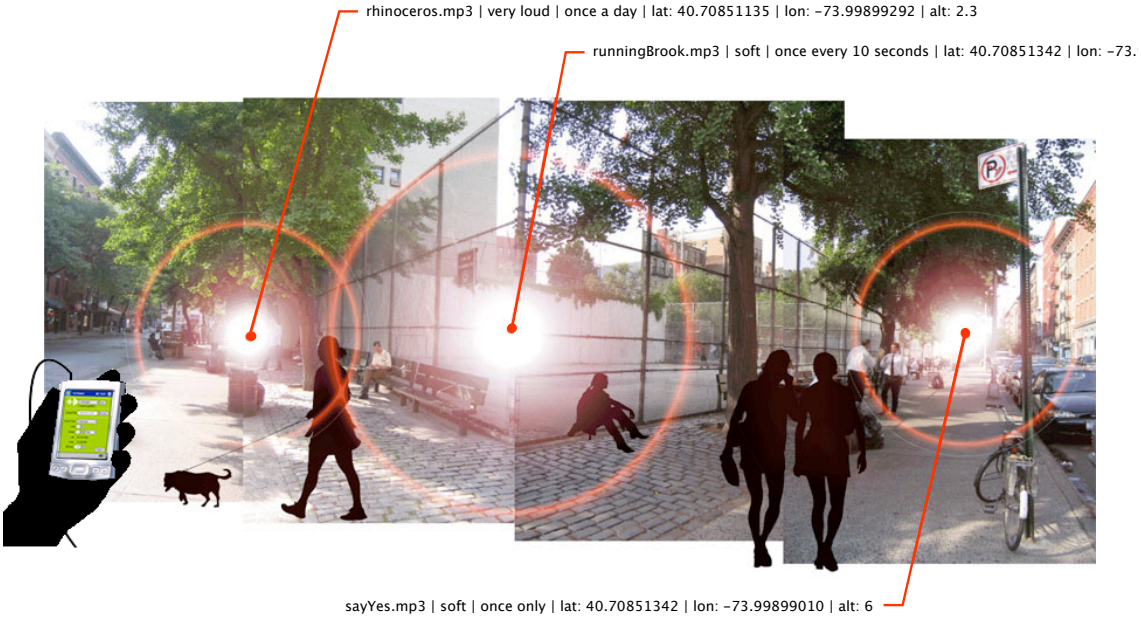


Figure 4: Tactical Sound Garden Toolkit [TSG] by Shepard, 2006

Shepard's virtual sound gardens (figure 4, page 60) are a "parasitic technology" using existing wireless networks that need not be owned by the person that is opening a sound garden by installing a 'TSG' server (Shepard, 2008a). The positioning of the participants works by a triangulation of wireless nodes and therefore this project only works in areas that have a high density of wireless networks. When entering a sound garden, participants download a client software as well as the sounds already planted in the garden onto their mobile devices, such as phones, PDAs or laptops. Participants can then 'plant' their own sounds and set attributes such as volume, repetition and altitude. They can also prune someone else's sound by changing the attributes of it and optionally leave a message for the planter. A 3-D (gaming) audio engine maps the sounds onto the physical environment. Shepard has often worked with existing communities and in

workshop settings to ensure critical mass of contributions to a sound garden (Shepard, 2008b).

Another way platforms have been used in mobile sound art, is the area of oral history. This continues the theme of historic narrative from the 'placed sound' category (see p.56), but now the audience contributes their own stories. The example I present is 'murmur', a mobile phone-based urban storytelling project in Toronto (since 2003). Signs with a phone number and an area code are put up in public places and invite people to call the number and to listen to the personal history other people have recorded for the specific location (figure 5, page 62). Participants stand in the very location while listening, "engaging in the physical experience of being there" while getting to know some of the place's history (O'Donovan, 2003). Some stories ask people to walk along a certain path while listening, making these stories an even more mobile experience. The oral everyday-history of people and their places is usually lost, especially when cities change. The artist's aim is to "keep these stories alive and on the streets," as they "can change the way people think about a place and the city at large" (Micallef, Roussel, & Sawhney, n.d.). Only the listening part of 'Murmur' works via the mobile phone as it facilitates listening to 'everyday-history' by using the everyday-practice of making a phone call. The recording of stories does not take place in its location, and not via mobile. Instead participants have to access the projects' website to type in personal details and some information about the story they wish to add. The artists then select from the entries and arrange to meet the people to record their stories at its location: 'Murmur' is a curated project, arguably a less 'open' platform than the earlier examples I discussed.

Figure 5: 'Murmur' in Toronto, 2003

Technologies such as GPS coupled with web-enabled phones would enable the audience to record and upload stories or other audio material themselves associated (or tagged) with a specific location. Some locative media projects such as 'Grafedia' (Geraci, n.d.) or 'Socialight' (Sharon, n.d.) have worked along those lines, but in a visual way. Murmur could be argued to belong into the earlier artist-curated category, but I stress that the audience is contributing the crucial stories (even if not in-situ), and the platform is key, having made this project a success in several cities (Toronto, Dublin, Edinburgh, Galway, Montréal, San Jose, São Paulo, Vancouver, and others) and over a sustained period of time (with 'Murmur' in Toronto running since 2003).

The 'sound platform' examples discussed so far have all relied on some form of private listening with the participants listening to the resulting sounds either via head-phones connected to a PDA or on their mobile phone. Now, I introduce examples of

'sound platforms' where the results of collaborative sound activities are broadcast into public space via speakers, affording a more public listening than with headphones. One examples is 'SmSage' by Redfern and Borland. The artists built a platform where the audience contributes to the piece by sending text messages, that are then broadcast into public space via a speaker. It is one of the few mobile sound art pieces that do not rely on headphones but on speakers for outputting the sound into the public. 'SmSage' is the case study from this 'Sound Platform' category that will be explored in more detail later in this thesis (see chapter 'Making and Breaking 'smSage", p. 175ff.). 'One Free Minute' by Daniel Jolliffe (previously called 'SanJoseVoices', 2006) is a sound platform where phone calls from the audience are broadcast from a bike with a speaker on a trailer (see figure 6, page 63).

Figure 6: 'One Free Minute' (2006) by Jolliffe (previously called 'San Jose Voices') broadcasts audience phone calls from this bicycle

Another example of a mobile sound art 'platform' piece that works with speakers is "IMPROVe" by Widerberg and Hasan. Helsinki, 1 April 2006: A person is standing in the train station, holding a mobile phone up into the air. Another person is crouching

down, edging closer towards a bunch of shrieking pigeons, inching a mobile phone towards the birds. About an hour later these two people meet up with a small group of others in the same train station. They are pressing keys on their mobile phones whilst being surrounded by the sounds of pedestrians, phones ringing, an argument between birds, sirens, urban bustle. Familiar station sounds, but in unusual combinations, volume and loops. The group is using their mobiles to collaboratively remix the sound recordings they made with the same devices earlier on. They are participating in 'IMPROVe' by Zeenath Hasan and Richard Widerberg (Hasan & Widerberg, 2006).[42]

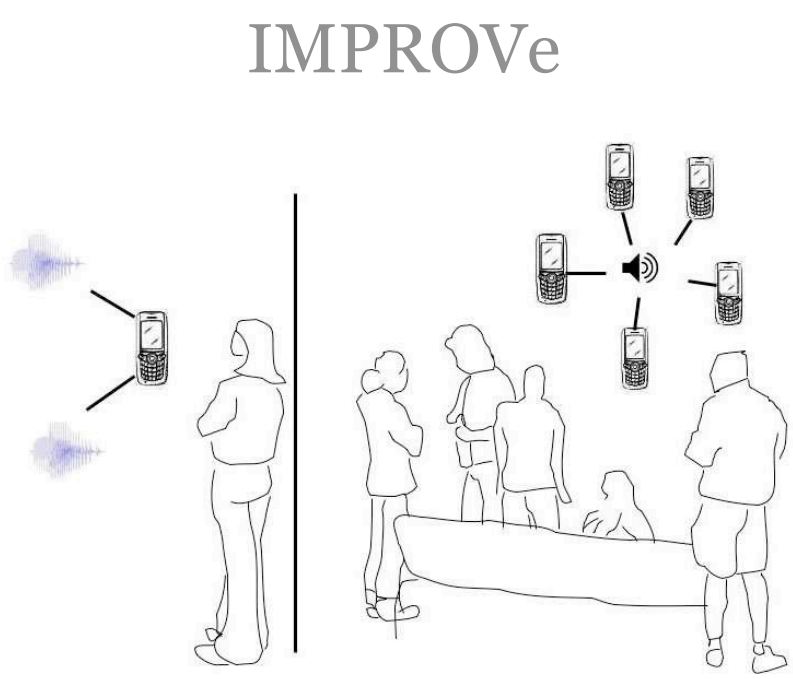


Figure 7: IMPROVe' by Hasan and Widerberg, 2006

The project works in two stages (figure 7, page 64): In the first one, the participants use the existing recording feature of their mobile phones to record sounds in their surrounding soundscape, at their own pace, and in locations of their choice, and then up-

42. The piece has since been 'performed' in a variety of locations (see Widerberg & Hasan, n.d.).

load them to a central computer that runs 'Pure Data' (PD). In the second stage, all the participants (about 4-25) come together and collaboratively remix these sounds via mobile phone; the resulting sound is emitted via a sound system. The participants use the four-directional button on the phone's keypad to play a randomly selected sound file and to control its volume, speed and loop length; the mobiles are remote controls for PD. This distinguishes 'IMPROVe' from most other (mobile) recording projects that tend to work towards some kind of sound archive, 'Mobilescout'[43] or '[murmur]', are examples.

These examples illustrate how 'sound platforms' enable artists to invite the audience to contribute to their pieces in various ways and how the sonic engagement in the mobile context is addressed. The content of the sounds contributed by the audience has been discussed as one distinguishing factor in this category: from 'any' sounds, including music and soundscape recordings to more narrative and historic sounds. Another distinction are private or public modes of listening, depending on the use of headphones or speakers for accessing the sounds accumulated on each 'sound platform'. It is interesting to note that headphones are often seen as a way out of the problem of filling public space with 'art' sound - whereas commercial sounds seem to be much less of a problem with shops and cafés playing music in public with few problems. A detailed engagement with 'sound platforms' takes place in the chapter '"Small Texts"?: Text Messages, Art and Public Spheres' (p. 150ff.).

43. Bleeker (2005) explains: "In this project, the phone is an interface for creating voice annotations that are linked to a playful real-world “scouting” scenario. [...] Their recordings are presented as a public collection that anyone with access to the web can browse and playback the recorded audio."

3. Sonified Mobility

This 'Sonified Mobility' category describes artworks that take advantage of the audience mobility (e.g. walking) to influence the very sound the audience is listening to. To understand this category it might help to imagine it pushed to the extreme: if the audience is not moving, it cannot experience the piece. While this is true in some way for all categories of this taxonomy, these works sonify mobility in a more direct way, some asking you to engage with your physical environment (e.g. 'Sonic City'), or inviting you to engage with your social network (e.g. 'Malleable Mobile Music'). Drawing on my earlier definition of mobile art (see p. 27) that insists on engaging with the condition of mobility, in this category the trajectory of the participants is *driving* the sound they experience in a variety of ways. Whereas the 'Placing Sound' category of artists augmenting space with audio was mainly concerned with the (changing) location of the audience, examples from this 'Sonified Mobility' category are mainly concerned with the mobility, the trajectory of the audience through space. These two concepts are not exclusive, but provide an important distinction in the focus of the artworks.

This category draws on a variety of backgrounds such as Sonic Interaction Design and NIME. Sonification of data, such as GPS data or other mobility-related data streams have been discussed in the newly emerging field of 'Sonic Interaction Design' (SID). This field deals with broader issues of interacting with and via sound in interaction design. The 2007-2011 European COST action[44] with the same title is a key factor in the merging area, and the mobile context has been one of the key concerns (Rocchesso, 2007). Another relevant backdrop is the field of searching for new interfaces for music-

44. 'COST' stands for "European Cooperation in Science and Technology" and "is one of the longest-running European instruments supporting cooperation among scientists and researchers across Europe" (COST, n.d.), and is organised by 'actions' that cover specific research areas.

al expression (NIME) that grew out of the CHI community. Discussions in this area are mainly concerned with stationary interfaces, but often consider gestural interfaces, ways to engage parts or the whole body in computer interfaces, e.g. with video tracking, sensors or wearable devices. For mobile sound art the scale is different, as the body does not only move in relatively stationary position, or on a delimited stage - the examples in this category use a street, a neighbourhood, a whole city as stage. This different scale has its own aesthetics, challenging the artists to map meaningful parameters to the speed and scale of human movement in the urban environment.

3.1 Key Examples

An early example of the sonification of mobility is 'Sound Mapping' by Ian Mott, Marc Raszewski and Jim Sosnin, presented in 1998 (figure 33, page 67). Shirvane (Shirvanee, 2006) and other list it as a key historic example, a "precedent for locative activities of improvised communication along an urban landscape". The artists describe their piece:

> Sound Mapping is a participatory work of sound art made for outdoor environments. The work is installed in the environment by means of a Global Positioning System (GPS), which tracks movement of individuals through the space. Participants wheel four movement-sensitive, sound producing suitcases to realise a composition that spans space as well as time. The suitcases play music in response to nearby architectural features and the movements of individuals. Sound Mapping aims to assert a sense of place, physicality and engagement to reaffirm the relationship between art and the everyday. (Mott, Raszewski, & Sosnin, 1998)

One specific instalment of the piece was realised in collaboration with a museum in Hobart, Australia where

> groups of individuals will wheel the suitcases with a Museum attendant through a specified district of Sullivan's Cove [...] following a path of their choice. Each individual plays distinct music in response to location, movement and the actions of the other participants. In this way a non-linear algorithmic composition is constructed to map the footpaths, roadways and open spaces of the region and the interaction of participating individuals. (Mott & Sosnin, 1997)

This is possibly the earliest example of using GPS technology for the sonification of mobility in art, a working experiment of attaching sound to spaces - and crucially to trajectories.

Figure 8: 'Sound Mapping' by Mott, Raszewski and Sosnin (1998)[45]

'Sonic City', another example of 'Sonified Mobility' was developed by Lalya Gaye with Ramia Mazé and Lars-Erik Holmquist in 2003. Participants walk around town with a wearable device (figure 9, page 69). Sensors pick up all sorts of environmental data and this is transformed into sound, experienced via headphones, making the walk a dialogue with the urban environment. By "turn[ing] the city into a musical interface" the piece is a specific sonification of an urban journey (Gaye & Holmquist, 2006). The participants "create a personal soundscape of live electronic music" where the data collected by the sensors "controls the audio processing of live urban sounds collected by the microphone" (Gaye & Holmquist, 2006).

45. No better quality image of this piece is available.

Figure 9: 'Sonic City' by Gaye et al, 2004

'Sonic City' has been discussed by the artists in several publications (Gaye, Mazé, & Holmquist, 2003; Gaye & Holmquist, 2004b; Gaye & Holmquist, 2004a; Gaye & Holmquist, 2006), and the piece has also been considered elsewhere (e.g. (Leahu, Thom-Santelli, Pederson, & Sengers, 2008) and (Galloway, 2008)), making it one of the better known works of mobile sound art.

The 2003 work 'Malleable Mobile Music' by Atau Tanaka is a multi-user application that allows a group of people to remix tracks of a song by their trajectory though the city; each person is linked to one track of the song. Tanaka describes the piece:

> Their movements about town, and their subconscious gestures while listening - be it gripping the device tighter in intense moments, or tapping along to the beat – are picked up the by sensors and sent up over the wireless network. The music engine takes this human-context information and transforms it into a musical context, using it to modulate, modify, and re-mix a piece of pop music. The connected users hear the same stream of music, it becomes a shared experience. (Tanaka, 2005)

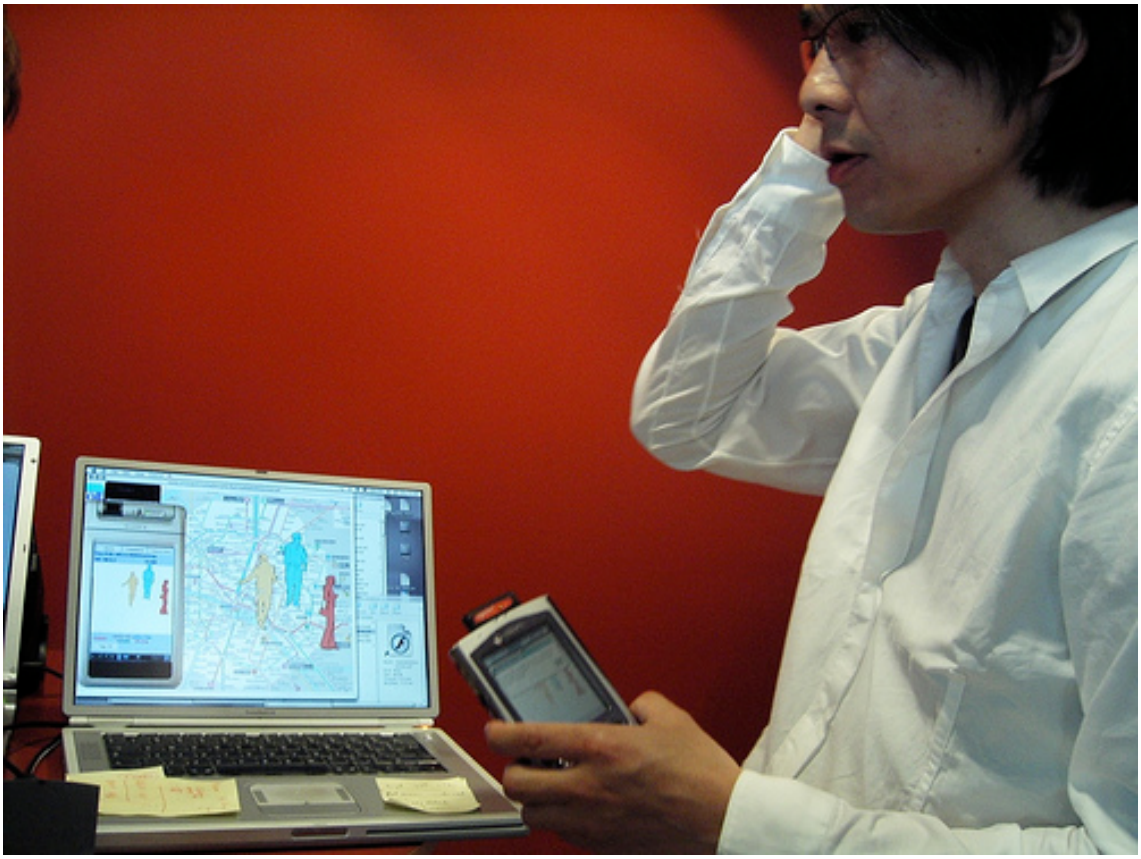


Figure 10: 'Malleable Mobile Music' at the 2004 Mobile Music Workshop, Tanaka presenting

Although the piece was mainly a prototype and has been tested more in smaller-scale settings, and not the large-scale urban context of its concept, it points out relevant aspects for the sonification of mobility. The collaborative and social aspects of 'Malleable Mobile Music' illustrate how our more recent and future devices that have all the sensors and networks on board already might allow musical mobility in everyday settings. The audience experiences a real-time "'social re-mix', a single audio stream of music that contains the social information, and that is listened to by all participants as a shared musical experience" (Tanaka, 2007).

'Soundbike' by Thompson (2005), "uses motion-based generators mounted to an ordinary bicycle to broadcast the sound of laughter as the bike is pedalled through the urban environment". Is is sonifying mobility as "The laughter is generated by playing se-

quences of short source clips that start when the bike reaches a cruising speed and then respond to the bike's velocity." A car-based 'sonified mobility' project is 'Pimp my Heart' by Etani (2006).

'Hlemmur in C' by Pall Thayer (2004) where the trajectory of two taxies alter the pitch, speed and vibration of a middle 'C'.

Figure 11: The speed of cycling controls the broadcasting of laughter in Thompson's 'Soundbike' (2006)

The focus on the trajectory of the audience through space and how this is translated into sound is at the heart of this category and each of the presented examples has interpreted this in a unique way. A more detailed discussion of this category will unfold in chapter 'Polyphonies of Footsteps' (p. 186) around the piece 'Aura'.

4. Musical Instruments

The category 'Musical Instruments' of this mobile sound art taxonomy comprises works that 'mis'-use existing mobile media - and especially mobile phones - as musical instruments. This category is probably the most 'musical'[46] of this taxonomy. The fields of NIME and SID have been introduced in the previous category and other aspects of both also are relevant frameworks for the category of 'musical instruments'. In both areas, artists are developing different ways to think about what kinds of interactions mobile devices such as mobile phones afford and how these could be re-used for musical interactions. You can talk, sing or blow into the microphone; shake, stroke or spin the device, use the camera, the touch screen and any built-in sensors, to name a few. The examples in this section are not necessarily labelled 'art', often they are understood as interface or interaction design. Interestingly, for this category 'mobility-in-use' is not strictly needed; most of these mobile musical instruments also work in stationary environments, indoors and in private settings such as at home. Just as any mobile musical instrument such as a recorder, harp (or maybe even guitar) it can be played on stage, around the camp fire, at home, alone or in a group. The difference is that it is not an 'extra' instrument, device, it is an added function of an already existing device that is always with us anyway - the mobile phone.

Mobile phones are not the first consumer media to be turned into musical instruments (see also p.33f.). Turntables and boom boxes are examples and the relation between mobile sound art and hip-hop culture is discussed by Gaye (Gaye, forthcoming). Game controllers and mobile gaming consoles such as the Game Boy have also

46. For definitions of 'music' and 'sound', see p. 30.

been re-fashioned as musical instruments (see Tonelli, 2009 and Behrendt, 2004, pp.62-69) and are important predecessors to mobile phones-turned musical instruments.

The 'Musical Instruments' category comprises those interfaces and applications that are developed for the specifics of the mobile phone. I argue that it is crucial to look at new paradigms for music and sound interaction in the mobile context, developing its own metaphors and interaction paradigms. Key technical challenges of developing musical applications for mobile platforms are summarised by Essl et al (Essl, Wang, & Rohs, 2008). Not included in this category are traditional computer music applications that become mobile versions, because their design paradigm is the mobile phones as miniature computer and the software is often a downsized versions of existing studio software - they are not developed for the specifics of the device and its context. Neither are those works included where the mobile phone acts as some sort of remote control, often in collaboration with other hard- and software, using data (e.g. keys pressed, camera stream) from the mobile phone as input for max/msp, for example (some of these works were listed in other categories of this taxonomy).[47]

4.1 Key Examples

'Mandala 3 and Mandala 4' by Greg Schiemer (2006), is one of the examples for this 'Musical Instrument' category (figure 12, page 74). It involves spinning a mobile phone on a string above your head in the middle of the street. Phones in a pouch on a string are spun overhead by the performers. The mobile phones are also used to to change and control the sounds played by each device, producing a Doppler shift: "During performance some players swing phones while others operate phones as hand-held controllers." (Schiemer & Havryliv, 2006, p. 37.) The artists explain the idea behind the work: "The Pocket Gamelan project is motivated by a desire to explore the features of microtonal

47. For example 'IMPROVe', see p. 64.

intervals found in many non-Western musical traditions and seeks to develop applications that allow microtonal music to be composed and performed using mobile phone technology" (Schiemer & Havryliv, 2006, p. 67).

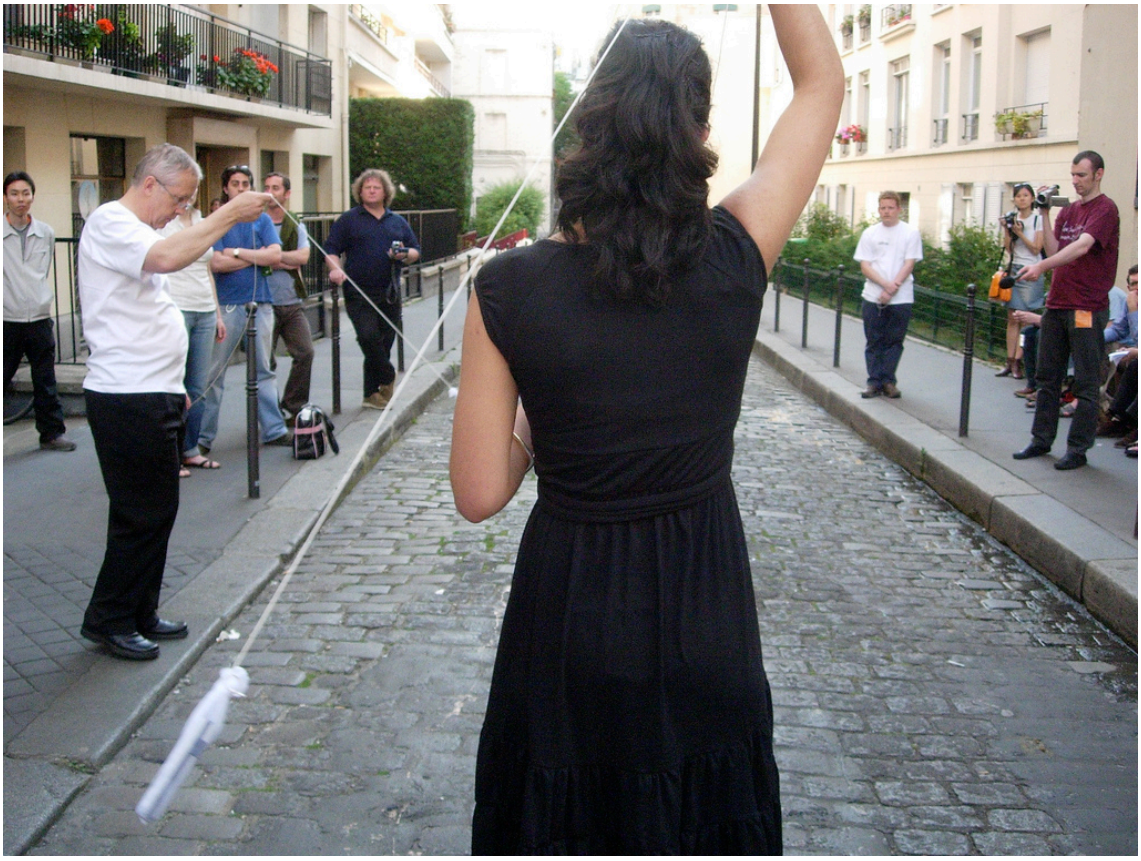


Figure 12: 'Mandala' by Schiemer, performed at NIME 2006 in Paris

A wide range of concepts for using the mobile phone as musical instrument have been developed over the last years, with the 2001 'nanoloop imode' (concept) by Wittchow probably the earliest example, see (Behrendt, 2004, pp. 62-70). 'Daisyphone' (2006) by Bryan-Kinns and Healey is an "interface for remote group music improvisation and composition" (Bryan-Kinns & Healey, 2004), 'CaMus' (2006) by Roh, Essl and Roth uses a mobile phone camera tracking system for gestural music making (Rohs, Essl, & Roth, 2006), 'Musical Devices' (2001) by Brucker-Cohen allows multiple players to use their mobile phones as remote controls for a collaborative music performance (Brucker-Cohen, n.d.), and 'Schminky' (2003) by Mobile Bristol is a musical game run-

ning on PDAs (as mobile phones were not 'smart' enough at the time) (Reid, Hyams, Shaw, & Lipson, 2004).

Artists have also used traditional musical forms such as the symphony, the opera or the musical in their mobile phone works. One move has been to invite mobile phones into locations of traditional musical performance, such as the concert hall. In 2001 Golan Levin had pioneered the idea of using mobile phones in a concert setting with his 'Dialtones. A Telesymphony' (Behrendt, 2004, pp. 28-37). The audience and their mobile phones became the orchestra, 'conducted' by the artist on stage (see figure 13, page 76). Audience members registered their phone number and ringtone before the event, and then received their seating assignment. Via a database with all this information Levin was able to call up to 200 audience phones at once (at a time of monophonic ringtones), structured by themes and movements, and joined by soloists on stage - playing with the juxtaposition of traditional musical form and the (then still relatively recent) proliferation of mobile phones and the taboo of them ringing in the art context (Levin, 2003).

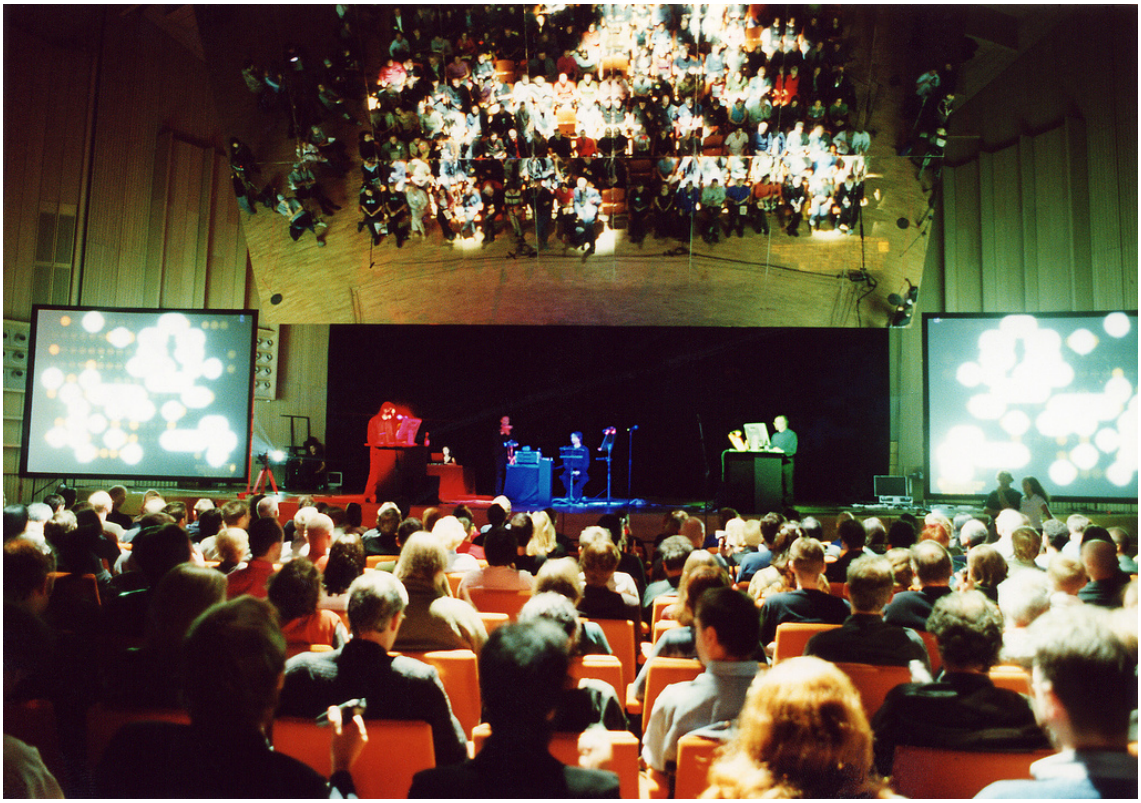


Figure 13: The audience and their mobile phones as orchestra in Levin's 'Telesymphony' (2001)

Elsewhere, orchestras have performed ring-tone inspired pieces such as the 'New Ring Cycle' by Turner and Moore (2002) and 'Spring Cellphony' (2001). Mobile-phone transmitted heartbeats have been used to generate a choir score and to drive a sound installation in 'Kadoum' (2000) by Waagenaar (Behrendt, 2004, pp. 28-37). A distributed musical instrument involving 144 mobile phones and a local radio station is Ligna's 'Wählt die Signale' (2003) (Behrendt, 2004, pp. 28-37). Ensembles of mobile phone instruments have also been forming: The 'Handydandy' (2008) is an example of a mobile phone rock band (Kirisits, Behrendt, Gaye, & Tanaka, 2008, p. 64.), an idea also pursued Wang and Essl's mobile phone orchestra MoPho (Wang, Essl, & Penttinen, 2008) (see also p. 131).

Figure 14: The mobile phone rock band 'Handydandy' performing in Amsterdam in 2006

In a mirroring move to inviting mobile phones into traditional art venues, artists and musicians have taken traditional forms of musical performance out into the city by using mobile phones. One example is 'Cellphonia. In the News' (2006) by Bull, Gresham-Lancaster and Perkis is a "location based karaoke opera" (Bull, n.d.) where the audience is invited to sing parts of the libretto into their phones, and the collaborative musical performance is shared via conference call (Bull, Gresham-Lancaster, & Perkis, 2006). The category of musical instruments will be explored in more depth in chapter 'Musical Telephones Old and New: A Media Archaeology' (p. 101) around the 'Pophorns' by Sandelin and Torstenson.

5. Timeline and Index of Mobile Sound Art

The timeline (p. 78) includes every work of mobile sound art that is discussed or referenced in this thesis. It adds a historic perspective to the taxonomy of mobile sound art by listing the pieces by year of first public exhibition (please note that many of them have been exhibited multiple times or are still ongoing). In addition, the timeline acts as a form of index for mobile sound artworks, as the page numbers where each piece is mentioned are included (if a piece is mentioned several times throughout the thesis, the key discussion is listed).

Figure 15: Illustration of the taxonomy of mobile sound art as a timeline and index

Taxonomy of mobile sound art: 'placed sounds', 'sound platforms', 'sonified mobility' and 'musical instruments'

Examples are ordered by year (x-axis) and category (colour). The location in brackets indicates where the piece was developed or (first) exhibited. "+" after the location indicates multiple locations/exhibitions. Where no location is indicated this could not be established or it is not applicable.

	1998	'Sound Mapping' by Ian Mott, Marc Raszewski & Jim Sosnin (Hobart, Australia, +) p.96
‘Trace' by Teri Rueb (Yoho National Park, Canada) p.52	1999	'Berlin Alexanderplatz 5.0' by Stefan Schemat (Berlin, Germany) p.53
'Hear&There' by Joey Rozie, Karrie Karahalios & Judith Donath (Cambridge, USA) p.59		'Augmented Reality Fiction' by Isabella Bordoni, Roberto Paci Dalò & Stefan Schemat (Linz, Austria, +) p.53
'Sonic Interface' by Akitsugu Maebayashi (Rotterdam, Netherlands, +) p.37		
'Infection' by Stefan Schemat p.53	2000	'Oasis 2000: Music for a Concrete Jungle' by Christina Kubisch (London, UK) p.50
		'Kadoum' by Johan Waagenaar (Zurich, Switzerland, +) p.76
'nanoloop imode' by Oliver Wittchow p.74	2001	'Dialtones. A Telesymphony' by Golan Levin, Gregory Shakar, Scott Gibbons & al (Linz, Austria, +) p.75
'TextFm' by Matthew Fuller & Graham Harwood (London, UK, +) p.171		'Musical Devices' by Jonah Brucker-Cohen p.74
	2002	'34 North 118 West' by Jeff Knowlton, Naomi Spellman, Brandon Stow & Jeremy Hight (Los Angeles, USA) p.56
'tunA' by Arianna Bassolli, Julian Moore & Stefan Agamanolis (Dublin, Ireland)	2003	'murmur' by Shawn Micallef, James Roussel & Gabe Sawhney (Toronto, Canada, +) p.61
‘Contact’ by Mark Bain (Amsterdam, Netherlands)		'Sonic City' Lalya Gaye, Ramia Mazé & Lars-Erik Holmquist (Göteborg, Sweden) p.68
'Wählt die Signale' by Ligna (Hamburg, Germany) p.76		'Malleable Mobile Music' by Atau Tanaka (Paris, France) p.69
'Daisyphone' by Nick Bryan-Kinns and Patrick Healey (Glasgow, UK, +) p.74		'Schminky' by Mobile Bristol (Bristol, UK) p.74
'Audio Nomad' by Nigel Helyer (Sydney, Australia, +)	2004	'Her Long Black Hair' by Janet Cardiff (New York City, USA) p.54
'Tactical Soundgarden Toolkit' by Mark Shepard (Barcelona, Spain, +) p.59		'drift' by Teri Rueb (Cuxhaven, Germany) p.52
'InterUrban' by Jeff Knowlton, Naomi Spellman & Jeremy Hight (Manchester, UK) p.55		'Wasser' or 'Water' by Stefan Schemat (Cuxhaven, Germany) p.54
		'aura. the stuff around the stuff around you' by Steve Symons (Manchester, UK, +) p.53
'One Free Minute' (previously 'SanJoseVoices') by Daniel Jolliffe (Columbus, USA, +) p.63	2005	'Location 33: A Mobile Musical' by William Carter and Leslie S. Liu (Culver City, USA)
‘Tool for Armchair Activists’ by ‘Troika’ (Sebastien Noel, Conny Freyer, Eva Rucki & Moritz Waldemeyer (London, UK) p.167		'Soundbike' by Thompson (Cambridge, USA) p.70
		The 'Handydandy' by Kirisits Nicolaj & al (Vienna, Austria, +) p.76
'Penninsual Voices' by Daniel Belasco Rogers (London, UK) p.56	2006	'Mandala 3 and Mandala 4' by Greg Schiemer (Wollongong, Australia, +) p.73
'IMPROVe' by Richard Widerberg and Zeenath Hasan (Helsinki, Finland, +) p.63		'Audio Graffiti' by Chia-Ying Lee (Ivrea, Italy, +) p.59
'CaMus' by Michael Rohs, Georg Essl and Martin Roth (Berlin, Germany, +) p.74		'Cellphonia. In The News' by Steve Bull (San Jose, USA, +) p.77
		'Pimp my heart' by Takehito Etani (Pittsburgh, USA) p.71
'aura: the stuff that forms around you' by Steve Symons (Cambridge, UK) p.187	2007	'Pophorns' by Erik Sandelin & Magnus Torstensson (Malmö, Sweden, +) p.103
'smSage' by by Tim Redfern and Ralph Borland (New York City, USA) p.151		'Stanford Mobile Phone Orchestra' by Ge Wang, Jieun Oh, Nick Bryan, Jorge Herrera & al (Stanford, USA, +) p.76
'Core Sample' by Teri Rueb (Boston, USA) p.217		
'Hidden Histories' by Armin Medosch (London, UK) p.57	2008	'Craving' by Bernhard Garnicnig & Gottfried Haider (Vienna, Austria, +) p.54
'Elsewhere: Anderswo' by Teri Rueb (Neuenkirchen, Germany) p.52	2009	'Ocarina' by Ge Wang p.132

6. Conclusion

Concluding, I point out how all four categories of my taxonomy - 'Placed Sounds', 'Sound Platforms', 'Sonified Mobility' and ' Musical Instruments' - share an engagement with mobile experience and the urban soundscape. Mobile phones in everyday life are often experienced as fragmenting activities and attention. Mobile phones are often used while doing something else, with our attention shifting back and forth between various layers of activities, e.g. between walking along a street and sending a text message. Bassett describes this as a constant shifting between "attention/inattention". She accounts for everyday mobile attention in an auditory way: "Mobile spaces tend to be prioritised over physical space, in a sense that it tends to be given more immediate attention. [...] To turn the attention away from the sensory rich environment of the streets and towards the thin thread of talk is to prioritise the auditory at the expense of the embodied and visual world" (2003, p. 348). How is that different if the mobile attention is not occupied with a "thin thread of talk", but a work of sound art that engages with the surrounding environment? Does sound art need the audiences full attention? Or could it also be one of several activities? The examples in this thesis illustrate that participation in sound art can take place in everyday life contexts, as opposed to visiting designated spaces and spending a set time (see also chapters 'Polyphonies of Footsteps' (p. 186) and 'Rhythmanalysis. Lefebvre on a GPS Sound Walk' (p. 216ff.)).

Another issue that all of the works have in common is that they all have to deal with the challenging technical conditions of mobile media with its abundance of hard- and software combinations as well as networks in the mobile phone market, and with the almost entirely proprietary software. This is an issue that came up in all my discussions with artists over the last several years, as will be pointed out throughout this thesis.

While this taxonomy has allowed us to gain a general understanding of the field of sound art, it is necessary to analyse selected pieces in more detail to understand how the mobility-sound-relationship is performed in interactive mobile sound art. The methodological framework for this more detailed analysis is developed in the following chapter.

III. Mobile And Sonic Methodologies

Studying how people experience and interact with urban spaces in relation to mobile media and sound through sound art poses some challenges. Two ephemeral, transient phenomena - our trajectories though urban space (e.g. walking) and sound - need to be grappled with in order to open up the case studies I set about to explore in my research. This methodological problem mirrors an issue at the heart of the research project itself: The very relationship between mobility and sound (e.g. as embodied by the walking participants) is one of the key issues this thesis aims to analyse. This methodology reflects the concerns of mobile media and sound by drawing on concepts of media, mobile and experimental ethnographies, as well as making the musicological concept of the 'musical event' productive as 'sonic event'.

In her discussion of methodological approaches in Cultural Studies, Saukko (2003) voices her concern with the visual paradigms in methodological discussions and the visual, often linear or un-interactive vocabulary like 'prisms' or 'points of view':

> The ideal of an 'encompassing' view, embedded in the notion of strong objectivity, draws attention to the general, whereas the notion of prisms underlines the importance of capturing the particular. If one is to imagine a methodological position between the general and the particular, however, it is best to switch sense from vision to sound or conversation. (Saukko, 2003, p. 30)

This argument for listening to sound when considering methodological issues is important to me. Saukko details how she thinks sound should be addressed on a methodological level in Cultural Studies:

> The metaphor of sound or conversation views different realities in more porous or interactive terms. Instead of arguing for fusing different realities into one view, or capturing separate realities, the notion of sound imagines different realities and methodologies in terms of soundscapes that each have their distinctive chords, but also resonate and interact with one another. (Saukko, 2003, p. 30)

This "sound-based approach" as suggested by Saukko (Saukko, 2003, p. 31) translates into my methodology as I use sound in various ways in my case studies. The world is not a synchronised orchestra but an assemblage of noisy market places, buzzing tube stations, impromptu conversations, etc.

Listening to people's accounts of their experience in the selected examples is one way to give structure and focus to this noisy world. Listening as a research practice can also be understood as a mode of attuning to the world (Highmore, 2006, p. 64 ff.). I understand research not as recording but as active *listening* to different part of the soundscape. I also recognise my own situated listening: Depending on my position and movement *as researcher* I will hear the soundscape in a particular way. This is not however a private world: the movement of the other sounding and reverberating objects and actors influence this listening perspective in space and in time. The researcher can focus on close by sounds, loud sounds, textures of sounds, the overall sound, the change over time, or on dynamics of sounds. Attending to the world not only with our eyes but also with our ears speaks of different, of richer (media) landscapes.

1. Media Ethnographies

My methodology draws on media ethnographies and more recent mobile media ethnographies. Influential ethnographical traditions in Media and Cultural Studies draw on 'new ethnography', addressing key concerns regarding the role of the ethnographer (as discussed in the context of TV ethnographies (Morley & Silverstone, 1991) amongst many others) and focussing on the lived realities of people, self-reflexivity and polyvocality (Saukko, 2003). New ethnography aims to bounce the observations of other's life off the researcher's own experiences, allowing as Saukko puts it: "a dialogic shifting between the scholar's self and the perspective of the other people being studied"

(Saukko, 2003, p. 57). Another key feature of new ethnography is the interest in "different modes of experiencing the world" including emotions and embodiment as non-rational modes of experiencing the world (Saukko, 2003, p. 57). Polyvocality is also a key feature of new ethnography, underscoring the multiple voices an individual might speak with in their account.

In addition to these concerns around the role of the researcher and the 'informant' , the traditional ethnographic notion of the 'field' has also become more complicated with accelerating globalisation and mediatization ; there have been many discussions around *Locating the Field* (Collins & Coleman, 2006), calls for 'multi-sited' ethnographies (Marcus, 1995) and Castell's (2005) work has inspired calls for 'networked ethnographies' (Howard, 2002). Partly in response to this Couldry developed the concept of 'passing ethnography' that addresses the ephemeral and mobile nature of media experiences and the challenges in researching these (Couldry, 2003).

In reacting to these changing notions of 'site' and 'fieldwork' Wittel (2000) suggests two key principles of ethnography need to be retained as it is reframed for online and networked ethnographies. First, that "[e]thnographic practice is attendance, is a co-presence of ethnographer and the observed social situation" (Wittel, 2000). And second, that "[e]thnography is about revealing context and thus complexity" (Wittel, 2000). Both issues have been complicated in online ethnographies, as researchers often only share the virtual space with the observed, not the physical space. The case studies of this thesis deal with hybrid spaces (see p. 2) where it is more obvious that digital and physical spaces have never been as divorced from one another as some early web research might have suggested. This is the case even if using the Internet through traditional screen and text interfaces while sitting down in front of a home computer - media users still have bodies and are placed in specific physical, social, political etc. contexts.

These connections tend to be more obvious, and possibly also more accessible in contexts where mobile media are used for network access. Whereas in online and cyber ethnographies, the difference between digital and physical experience is often stressed, mobile media ethnographies tend to be more aware of the close relationship between these two. Wittel states: "Rather than emphasising the differences between material and digital spaces, we should introduce a more relational perspective and concentrate on the similarities, connections and overlappings" (Wittel, 2000). My research stresses the articulation of physical and digital spaces at once, the participants in the art works engage with networked media and physical space at once. This makes for complex experiences and Geertz' "thick descriptions" are still a useful way to think about context and complexity, being informed primarily by what happens in the field, but also by the desk bound stage of dealing with the research material (Geertz, 1973, pp. 3-33).

One of the implications of multi-sited research is that there is less time available for each site (with funding available for the research travelling also playing a role). This could be perceived as being at odds with the key ethnographic values of participation and immersion (see Hine, 2000). However, when researching media cultures that are familiar to us, the 'field work' arguably started years before the actual research, when the researcher becomes part of the media culture studied (Bird, 2003, p. 7). This is true for myself. I have been part of Western media culture all my life, and a part of the 'sub-culture' of (mobile) media art for a decade. I could be considered an insider in the field of mobile music and sound as I know many of the artists and have been actively involved in the field for years.

"Temporal dislocation" and the degree of immersion are also issues in virtual ethnographies (Hine, 2000, p. 65). Hines argues that in virtual ethnographies the informants "can be absent" but rendered "present within the ethnography" (Hine, 2000, p. 65).

This absence/presence dilemma of virtual ethnographies is different in mobile ethnographies, where researcher and 'informant' are often co-present in *physical* space. Possibly, the challenge is rather to also inhabit the same *digital* space as the 'informant', as the mobile and intimate nature of audio and portable media are not designed for sharing the media experience most of the time.

Inhabiting space and time of informants in a field is a process; and building upon his insistence on experience as starting point for studying media (1999, pp. 1-12), Silverstone calls for the "examination of media as process, (...) as a thing doing and a thing done at all levels, wherever humans congregate both in real and in virtual space" (1999, p. 4). These processes of congregations across 'real' and 'virtual' spaces are on the move - "our daily passage involves movement across different media spaces and in and out of media space" (Silverstone, 1999, p. 8) - and increasingly, media spaces move with us, and we rarely move entirely out of them anymore.

The domestication of media has been a key theme of media ethnographies (Silverstone & Hirsch, 1992; Morley, 1992; Berker, Hartmann, Punie, & Ward, 2005). Berker, Hartmann et al summarise domestication as "a theoretical framework, a research approach, which considered the complexity of everyday life and technology's place within its dynamics, rituals, rules, routines and patterns" (2005, p. 1). Most media ethnographies tend to deal with indoor settings, either domestic ones such as living rooms or public ones such as movie theatres. Online or web-related ethnographies have also mainly focused on indoor settings, the PC in the domestic setting, or internet cafes for the public setting.

Also, there is often a textual and visual focus in online ethnographies, and only recently have bodies tended to take a more prominent position in online ethnographies (e.g.Mowlabocus, 2006). With the proliferation of mobile media devices the "move-

ments in space and time" of ourselves and the media seem to become the default condition, and consequently our way of studying the media also has to become more mobile.

Methodological concerns concerning the studying mobile audiences (who use mobile media in public and mobile contexts) have been discussed in very broad brushstrokes (Sorice, 2007) in a more detailed way: Hartmann's mobile ethnographies (2006) as well as Silverstone and Sujon's 'experimental ethnographies' (2005) both raise relevant issues for my project.

In 'A Mobile Ethnographic View on (Mobile) Media Usage?' Hartmann "question[s] the notion of mobility in relation to ethnography" and the "mobility of the researcher him- or herself" (2006, p. 273). She gives a critical assessment of how the domestication approach that had been built around "the home, i.e. a relatively clearly defined spatial boundary and media use therein" has been adopted to look at mobile media and she argues that the spatial aspects of everyday life are frequently "underestimated" in these attempts to use the domestication approach for mobile media (2006, p. 277). Like me, Hartmann also regards multi-sited ethnographies as an important background for mobile ethnographies. However, in reviewing some of these attempts, she criticises them as too descriptive (Lasen, 2003) or lacking complexity (Plant, 2001), and crucially points out that the researchers themselves were not mobile in each site (2006, pp. 281-282). Hartmann explores two studies that involved mobility of the researcher. One of them, 'Urban Tapestries' - a public authoring platform for multi-media geo-tagging - I return to in the following section (see p.87).[48] Hartmann's conclusion is that "the mobility remains the actual challenge" (2006, p. 294) and she calls for further extended

48. The other one is the 'Urban Mobilities' project, and especially the '73 Urban Journeys' part of it.

methodological experiments around mobility in media ethnographies. This thesis aims to contribute to this experimental space.

2. Experimental (Mobile) Media Making

In a paper which also discusses the 'Urban Tapestry' project, Silverstone and Sujon describe their research as 'experimental ethnography', defining this as being:

> about fluidity and openness, not only as a method but also for capturing emergent characteristics and impressions of a new technology. This is a methodology for tracing connections and change, as it happens, instead of as it is predicted. As such, experimental ethnography is not representative or generalizable, nor does it aim to be. (Silverstone & Sujon, 2005, p. 10)

I agree with this characterisation and understand my methodology also as taking into account the constantly changing ways we experience and perform mobile media "as it happens". Silverstone and Sujon argue that experimental ethnographic approaches share an emphasis on "the importance of creative approaches to difficult and/or elusive research subjects and/or phenomenon" such as mobile ones (Silverstone & Sujon, 2005, p. 15). I add *sound* to the list of these elusive research phenomena, a focus not developed in Silverstone and Sujon's paper.

Using a combination of public media authoring, walking and interviews as methods in Silverstone and Sujon's research does provides an important, but largely visual predecessor to my choice of methods in this thesis. Hartmann values the projects methodology as producing "thick descriptions" and as regarding the mobile technology as both object and tool (2006, p. 292), something I am also aiming for in my research.

Similar to Silverstone's and Sujon's 'Urban Tapestries' research set-up, my case study research engages the audience with experimental mobile media, the audience walks and creates *in situ*, and they are interviewed after the experience. But their set-up also differs from mine in several ways: the authors are part of the team developing the

mobile media work, and the participants know all about the set-up of the study before they set off for their mobile media walk, their public authoring; Whereas I have not been part of the development of any of the selected case studies and only asked the participants if they would agree to be interviewed after they completed their participation in the piece.

Silverstone and Sujon suggest in their methodological discussion that they are using mobile media platforms as experimental ethnographies in a double way, because the projects itself is still in development, and thus experimental. This point is also interesting for my research, as some of the case studies were also in earlier stages of development.[49]

I connect this idea of using a mobile media project as 'experimental ethnography' with Gauntlett's argument for the incorporation of 'making' in media studies methodologies. This allows me to develop my argument for the productiveness of interviewing the audience members *after* they interacted with the piece - since this was the method I adopted. In *Creative Explorations* (2007) Gauntlett is on a quest to find an "alternative for language-driven qualitative research methods" (2007, p. 4). His focus is solely on visual methods as alternatives to language-based methods - here I am suggesting ways to make some of his arguments fruitful for sonic research as well. He argues that if people make something creative with their own hands and then talk about it, this gives them time to reflect and enables people to talk about difficult-to-verbalise topics such as identity.

The methodology Gauntlett develops (based largely on a mix of neuroscience, media studies, sociology, philosophy of science, linguistics, visual culture, and art) is "an approach which allows participants to spend *time* applying their playful or creative *at-*

49. The authors and developers of 'Urban Tapestry' faced similar technological limitations as some of the case studies dealt with, such as GPS reception issues, see chapters four to eight of this thesis.

tention to the act of *making* something symbolic or metaphorical, and then reflecting on it" (2007, p. 3) [emphasis by the author]. "Making" is the key concern for Gauntlett, and I argue that engaging with interactive art can be described as co-producing, as bringing the work of art into being - and it can also be regarded as some kind of making. The constitutive role interaction can play in sound and media art has been discussed earlier (see chapter 'Approaches to Locative, Sound and Public Art', p. 15 ff.), and I argued that the participation of the audience is key in establishing the piece. Interviewing the participants after they sent a text message, played a mobile phone musical instrument or choose their trajectory through space, is similar to the moment after Gauntlett's participants built their Lego metaphors.[50] This active involvement, this *sonic making* is a key methodological concern for me.

3. Ambulant Considerations

In the previous section I argued how participating in an artwork can be understood as a form of 'making', and now I consider how the very mobility of the audience can be part of this making process, part of creating a work of sound art - and how this mobility needs to be taken into account methodologically. The wider methodological considerations of a mobile media audience - in cars, public transport, cycling, running or walking - need to take into account the complexity of the ever-changing context as people travel while using mobile media. I chose to explore a sub-section of media mobility, walking,

50. For the main study presented in his book, Gauntlett trained to be a Lego Play facilitator, modifying Lego's consulting-like business courses for his sessions (2007, pp. 128-157). He works with various groups and each session is structured as follows: In the first part the participants do some warming-up Lego construction and learn about about hand-mind connection and metaphors, and build small creatures and metaphors. In the second part of the session each participant builds a metaphorical model of their identity and then shares the stories of all models in the group. In two more 'rounds' outside influences to the identity models are added and discussed. Finally, all participants fill in a questionnaire. I am critical of the way Gauntlett set-up his study, for examples using questionnaires over interviews, and also about the way he partly presents and interprets his findings in a rather quantitative way, and without paying much attention to the importance people assert to music. Nevertheless I agree with Gauntlett's argument for the inclusion of *making* in media research, for developing non-verbal and creative methodologies.

as for two of the case studies ('Aura' and 'Core Sample') the very participation, the making, is walking. The other two case studies ('Pophorns' and 'smSage') also work with mobile media but participants can engage either while they walk or choose to be stationary, stopping at a street corner for example. Each form of media mobility has its own aesthetics and for my methodological considerations I focus on the specific experience of walking, drawing on my earlier considerations of the role of walking in locative art (see 'Walking as Remixing', p. 21ff.).

I aim to take a mobile, an 'ambulant approach' in my methodology. The term comes from Simon Pope who also uses the term in relation to his art practice. He carried out research at the Banff Institute in Canada and "studied art practices that utilise ambulant methodologies, such as walking" (Banff, n.d.). The results of his study were presented in the form of artworks in an exhibition, not in the form of a written publication but he does mention some aspects in his paper 'The Shape of Locative Media' (Pope, 2005). Pope aims to "bring walking towards locative media as a methodology: as a way of finding out about the world and, in particular, what happens when a mobile agent operates on these technologies" (2005). He develops his 'ambulant methodology' as an art practice, but I suggest that ambulant methodologies are also valuable in theoretical media research. Pope describes how portable technologies often force us to stop walking when accessing location-based technology, which is at odds with its assumed mobility:

> While the technologies are supposedly mobile, PDAs with wireless cards and regular cell phones show an awkwardness when between the points that define their operational space; they have no problem in being portable, but prefer the moment when they can be stationary and in a precise, stable relation to the nearest mast or access point. (Pope, 2005)

While the very devices we use have matured, the mainly screen-based interfaces still require stopping or at least slowing down our walking. Pope discusses walking as a visual methodology, whereas I aim to develop multi-sensory and especially sonic ambulant

methodologies. Pope distinguishes between sedentary and mobile forms of knowledge, and argues that both are found in locative media projects. I suggest that non-screen-based forms of mobile media interactions, as found in mobile sound art, might shift the focus from sedentary to mobile, towards an "ambulant knowledge that enables an understanding of being in between stable points" (Pope, 2005). I argue that walking allows us to focus on the trajectory instead of location; on movement, not standing still, and the necessary engagement of the body while walking reminds us of the importance of embodied forms of knowledge, as I argued above (see section 'Arguing for 'Mobile Art' ' (p. 27ff.)).

It is important to keep in mind that mobility - of a different kind - has always been part of ethnographic work, "the role of travel, physical displacement, and temporary dwelling away from home in the constitution of fieldwork" is "a crucial and ambivalent anthropological legacy" (Clifford, 1997, p. 186). For future research projects, a consideration of ethnographies in urban geography and anthropology of mobilities/globalisation would be highly relevant to develop mobile media methodologies further. Drawing on De Certeau's (1984) concept of space as "discursively mapped and corporeally practised", Clifford understands "fieldwork as an embodied spatial practice" (1997, p. 186), an argument developed further in the chapter 'Polyphonies of Footsteps' (p. 186ff.).

Hall et al. (2008) make a methodological argument for the combination of sound and mobility for qualitative research interviews, and suggest to use art practices such as sound walks.[51] Hall et al's contribution shows that methodological discussions around sound and mobility are timely and need more research. After considering the mobile

51. This paper was published after the methodology for this thesis was developed, the field work was carried out and the analysis drafted.

and ambulant aspects of my methodology it is now time to focus on the sonic aspects of the methodology.

4. Sonic Events

Finally, I return to methodology and sound. In developing my methodology I drew on the area of new musicology, and especially De Nora's concept of the 'musical event' to adopt it for the world of sound, proposing the concept of the 'sonic event'. For me, sound is a wider concept than music, including at its broadest definition all audible phenomena (including music). We are constantly surrounded by sounds created by ourselves, others, and all sorts of objects and media in our environment. DeNora's concern is how music and society are co-produced at the "level of situated activities" (2004, pp. 38-39), a useful term for thinking about the case studies in this thesis as it highlights the relevance of context and activities as well as the relation between them.

DeNora aims to find some middle ground between (new) musicology's focus on the musical material and music sociology's concern with the broader social context (2003, pp. 35-58). She criticises traditional musicology and also 'New Musicology' as being still very much focused on the musical material while at the same time, for DeNora, sociologists of music tend to pay too little attention to the uniqueness of the musical material (2003, p. 36). New Musicology's acknowledgement of the existence of social structures and using them as "a backdrop or foil for detailed musical analysis" does not go far enough for her; as still "the social was not theorised in a manner that could highlight the mechanisms of its making and remaking" (2003, p. 37).

Rejecting structuralist approaches (2004, p. 38), De Nora uses Latour to claim that "there is no methodology for describing music as it 'acts' within actual social settings, eras and spaces, and in real time" (2003, p. 39). After identifying this gap in methodo-

logy, she suggests combining the strengths of New Musicology and sociology of music to develop an empirical way of studying 'doing music' at what she deems as the right level of detail:

> Its focus is on music as (and in relation to) social *process*, on how musical materials (and the interpretations and evaluations of these materials) are created, revised, and undercut with reference to the social relations and social contexts of this activity. It is also concerned with how music provides constraining and enabling resources for social agents - for the people who perform, listen, compose, or otherwise engage with musical materials. (2003, p. 39) [emphasis by the author]

In short, DeNora's approach "attends to the question of how links between music and agency, music and forms of community, music and ideas, come to be forged" (2003, p. 39). Researchers cannot just assume these links, or think social structures are mirrored in musical material or that musical material affects social structures - these links have to be proved, not assumed, by following "actors in and across situations as they draw music into (and draw on music as) social practice" (2003, p. 40). DeNora elaborates this argument:

> [W]hat is required is a focus on actual musical practice, on how specific agents use and interact with music. Such an approach makes no assumptions about 'what' music can do but examines music's social 'content' as it is constituted though musical practices in real time and in particular social and material spaces. Only though observation of these *practices* is it possible to document music's mechanisms of operation, to follow agents as they *do things with music*. (2003, p. 41) [emphasis by the author]

I add that 'doing something with music' happens at two levels: at the level of the people being studied, as suggested by DeNora, but also at the level of doing research. This thesis 'does things with music and sound', selecting certain examples is already doing something with sound or music, as is discussing it in a certain context and not in another.

DeNora's concepts are geared towards music but I argue that some of her framework can also be use for researching sound. As argued earlier, in everyday life sound is

rarely treated as an aesthetic resource but it is nevertheless a key part of our daily lives. Sound art points out the aesthetic potential of sound, and participating in sound art is often hoped to attune our ears to the sounds of the world.[52] I argue that sound both in art and in everyday live has been largely overlooked in music-related studies, and has only recently come into its own right with the study of auditory phenomena in the emerging field of sounds studies.[53] However, the long tradition of music-related studies such as musicology and sociology of music provide relevant frameworks for researching sound.

DeNora (2003, pp. 44-45) questions whether it is enough to ask people to talk about their experience of music. Instead she suggests to "explore music as it functions *in situ*", "as it is *used*" [emphasis by the author]. This move has been inspired by Media Studies which DeNora credits for "having taught us how the meanings of cultural media (including their perceived 'value') - come to be articulated through the ways people (media consumers) interact with media products" (2003, p. 45). This articulation happens in specific moments, moments "when music" - and for me sound - "comes to serve some way as an organising material for action, motivation, thought, imagination, and so forth" (2003, p. 46).

DeNora's concept of affordance is useful in thinking about articulation. It stresses "music's effects as dependent upon the ways that those who hear it respond to it; how they incorporate it into their action; and how they might adapt their action" (2003, p. 48). Using her argument for research into sound would look at how sound can be a resource for "agents as they mobilise cultural structures to produce and reproduce organisations", how sound can be world-building, and would also consider what makes sound possible and sound's role as mediator of the social (2003, p. 46).

---

52. For a more detailed discussion of the aesthetic treatment of sound see section 'Sound Art' (p. 29ff.).
53. See section 'Sound Studies', p. 4ff..

Translating this level of analysis - less broad then the sociological one, but broader than the musicology one - into a research method De Nora develops the concept of the "musical event" (2003, pp. 48-50). The musical event has five different components: actor(s), music, the act of engagement with the music, the local conditions of doing so, and the environment. The musical event also has three moments in time: before, during and after. I suggest that the concept of the musical event can also work for sound, we can talk about a "sonic event". In fact, there are various sonic events happening in each case study, thinking about the case study 'Aura' for example, very specific instances such as 'me doing a sound walk' could be considered as "sonic event" with me being the actor; the engagement with sound being the sound walk; the local conditions being me on my own with the mobile device and headphones; the environment being an urban park in the UK; the times to consider are before, during and after the event.

5. Research Activities

The research for this thesis draws on the methodological framework as discussed in this chapter. A focus on the *making* of mobile sound art both on the side of the artist and the audience has been a guiding principle in favour of an approach that would have focuses on the aesthetics in and of itself. Ethnography was variously addressed in terms of re-searching participant's experience and the artist's concepts but also in terms of my own immersion in an art field.

I have been observing the broader field of media art and sound art with a focus on 'mobile' examples since 2001, attending various relevant conferences and festivals (Ars Electronica 2000-2005, Transmediale 2002-2005, next five minutes 2003, Futuresonic 2004 and 2007, ISEA 2004, Mobile Music Workshop 2004-2007, Conflux 2007, etc.) and documented artworks at several of these events with photographs, video recordings

and artist interviews. Further examples of mobile sound art were researched through exhibition catalogues, conference proceedings, websites, mailing lists and personal correspondence with artists.[54] From these sources, I have been building up an archive of projects in the wider area of mobile sound art. The previous chapter 'taxonomies' discussed in more detail the work of constructing the archive of examples and how the taxonomy was assembled. This archive has driven the taxonomy and also informed how I constructed the discussion of the influences on the field of mobile sound art in the earlier chapter 'Approaches to Locative, Sound and Public Art' (p. 15ff.).

Documenting, collecting and preserving media or digital art has become a major concern for art institutions. There is a wider discussion of how time-based art (that is not an 'object') can be studied, documented or collected (New Art Trust, n.d., see also "MediaArtHistoriesArchive" and its 2005 "refresh" and 2007 "re:place" conferences). After a focus on using various media for documentation, there has been a growing interest in conducting *interviews with the artists* over the last few years: "Extensive interviews and writing has proven great success in documenting the concepts of an art work, especially when it is the concept that is being acquired, not an actual object" (Poloni, 2005). One of those schemes incorporating artist interviews suggests to describe art works by using eight "behaviours" (networked, encoded, duplicated, reproduced, interactive, performed, installed, contained) that are used to stimulate interviews with the artists (Ippolito, 2003). For each of the four case studies, I met the artists in the location of the artwork and conducted an extensive interview with them. This interview material is used throughout the following chapters of this thesis.

---

54. In the following chapters I discuss examples that I have experienced myself for the most part. In some chapters these examples are complemented by other relevant artworks, drawing on secondary sources.

The four case studies that I deal with in-depth in the following chapters of this thesis are chosen from one of the four categories I outlined in the taxonomy of mobile sound art earlier (p. 48ff.). Each case study takes into account its unique geographical, social and artistic environment. The selection of one specific example from each category has been made on a number of criteria. After observing the field for several years, I contacted a number of artists to find out about their upcoming works and analysed upcoming relevant events such as exhibitions and festivals. The list of examples that emerged from this, was subjected to some rather pragmatic criteria, such as the time scheduled for the the field work and the budget constraints of travelling to the relevant locations: The selected pieces of mobile sound art took place in spring and summer 2007; they actually worked (even if not as planned); I was able to travel to the location of the piece; and I was able to collect a variety of material on site.

The case studies discussed in the following chapters are situated in four different geographical sites: a new media festival in a Cambridge Park (UK), a music festival in Malmö (Sweden), a National Park on a Boston Harbour Island (US), and a phsychogeographic festival in Brooklyn (US). Future research beyond these Western contexts would be a relevant complement to this study; resources mitigated against this. Each project, art piece, is a momentary and often fragile assemblage of specific locale conditions, mobile devices, network protocols, database software, network carriers, audience members, the built environment, the weather, and so forth. The specific methods used 'on site' and the material collected for each case study is described in more detail in the respective chapters, as each one required a specific approach.

My own experience of the pieces was key to understanding the way each mobile sound art example 'works', and my research was drawing on self-ethnography by having to take part in the pieces. I experienced each piece myself, spending time with it, trying

it out, taking on the role of a participant. I accounted for my own experience with voice-over audio recordings of participating as well as video recordings, photos and field notes. I also collected research material about the context, including observations of participants and the context the work it was presented in as well as talking to other people involved (e.g those handing out the devices). Field notes, photos, video and audio recordings were instrumental in this process. The illustrations I use throughout the thesis are not meant and not able to document these sound pieces; they need to be seen in the light of all the methodological concerns discussed in this chapter.

An understanding of and immersion into the landscapes that were the sites of the mobile sound artworks was also a crucial part of the field work. I also researched the technical set-up of each piece and the institutional context it was presented in (e.g. the relevant festival). Furthermore I gathered and analysed festival or exhibition programs, flyers, web information etc. For one case study ('Core Sample') the guest book entries proved to be a key resource for discussing the audience perspective of participating in the work. Copies of the guest book were transcribed and analysed in this case.

My aim was to interview audience members in semi-structured interviews for each case study, but only for one of them ('Aura') the audience interviews were rich enough to be discussed in this thesis. For each case study, I interviewed the artist(s), as discussed above. The many hours of artist and audience interviews were recorded and transcribed. Re-occurring themes in the interview material were identified to structure and analyse the accounts.

Initially, I was wary of using photographs in this thesis, as it is focussing on auditory, not visual experience. However, I decided to include photographs from my field work because it does give a sense of place, if not of the sounds experienced. The setting

of each work of art can be glimpsed form the images, the sounds I attempt to describe in the text.

Theoretical and historical frameworks that resonate with these themes were selected to analyse the material. The case study 'Musical Telephones Old and New: A Media Archaeology' (p. 101ff.), for example, draws on historic material that was researched regarding the musical history of the Telephone. A way to understand the connection between 21st century phenomena (such as the 'Pophorns' or the 'iPhone ocarina') and phenomena a century earlier (such as the 'Telharmonium' or early musical performances of the Telephone) is to think about them in media archeological terms. The relevant concept of media archeology is discussed in more detail later, in the section 'The Early Musical Days of the Telephone' (p. 120ff.).

One of my key concerns was to find audiences of mobile sound art. For each case study I had to find evidence of audience experience in different ways. I found audiences by going to sites, reading (physical) guest books and by exploring online forums, to name but a few. For several case studies I also researched various online sources to complement the material from the field work. The experience of people using mobile sound media is accounted for in online forums, in YouTube videos and on the websites of 'instrument makers' come software designers - this is especially the case for the iPhone ocarina and the 'Pophorns' as discussed in the chapter 'Musical Telephones Old and New: A Media Archaeology' (p. 101ff.). I used Christine Hine's basic approach of virtual ethnography to observe how people talk on forums regarding their use of the iPhone 'Ocarina' (Hine, 2000). Overall, the practices of making, using and experiencing contributes to the ethnographic aspect of this research.

6. Conclusion

This chapter has developed the methodology behind my research into mobile sound art, and especially in regards to the cases studies reported on in the following chapters. Broader ethnographic considerations such as multi-sitedness, polyvocality and the role of the researcher has prepared the ground for a discussion of media ethnographies, and especially how the concept of domestication (drawing Silverstone, Morley and others) is challenged by mobile media (Hartmann) and explodes back into the city. Drawing on Silverstone and Sujon (2005) I have shown how mobile art projects can be used as case studies to access difficult-to verbalise experiences such mobile ones. Following Gauntlett's argument, creative making can give access to a different type of knowledge, to talk about difficult-to-verbalise topics.

I have also discussed how walking becomes part of the methodology, both for the researcher and the audience and have argued that mobile phenomena should - at least partly - be studied with mobile methods, and what artist Simon Pope calls "ambulant methodology" inspire this research. I have argued how DeNora's concept of the musical event can be critically applied as sonic event. Mobile media have become ingrained in everyday life and thus are increasingly 'invisible'. Choosing to research artworks makes the use of mobile media 'strange' again, questioning familiar patterns of use, making their use problematic. This chapter also pointed out how these considerations translated into the research and field work that I carried out based on this mobile and sonic methodology.

IV. Musical Telephones Old and New: A Media Archaeology

This chapter explores 'Pophorns' and the iPhone 'Ocarina' - both examples of the *Musical Instrument* category (p. 72ff.) of mobile sound art that I defined as using existing mobile consumer media (such as mobile phones) as musical instruments. Taking a historical perspective, I argue that 'new' musical and sonic uses of the mobile phone have in fact a long history: In the first decades after its invention the telephone was used musically in a variety of ways, from public musical performances of early telephone sales people to the 200-ton telephonic instrument called 'Telharmonium'; and these are discussed alongside the contemporary 'mobile phone instruments' in this chapter. I draw on Huhtamo's concept of 'media archeology' (1996) and existing media archeological work regarding the history of the telephone, read it with a musical focus and connect it to recent mobile phone developments. I argue that the musical use of the telephone is in fact not 'new' but a re-occurring topos.

The chapter is not structured chronologically; instead it develops two musical themes of telephonic history that structure the chapter: the telephone apparatus as musical instrument and the telephone network as musical instrument.

The first two sections of the chapter are focused on using the telephone apparatus as a musical instrument. The first section starts with a focus on an application ('Pophorns') that turns your mobile telephone into a musical instrument, and shows how public and group performances with these instruments are a crucial part of it. In section two of the chapter, in a media archaeological move, I discuss a variety of musical uses of the telephone from the early days of its invention: in public presentations of this 'new' techno-

logy singing over the line was a key aspect, the 'musical telegraph' was performed in concert halls, and switch board operators entertained subscribers with guitar play.

Section three and four of the chapter develop the second theme of this chapter: the use of the telephone network as musical instrument. The third chapter section brings us back to the present decade, discussing the highly popular musical iPhone application 'Ocarina' (2008), that turns the mobile phone and the network behind it into a musical instrument, allowing performers to play for remote audiences. Section four goes back in history again, reporting how more than a century ago the musical instrument 'Telharmonium' also used the telephone and its infrastructure to play, amplify and transmit music. I conclude this chapter by pointing out how the media archaeological perspective allows me to go beyond the 'newness' of using telephone for music making and summarise the underlying discourses of this topos.

1. 'Pophorns': Mobile Phones as Musical Instruments

'Pophorns' is a piece of software that turns your mobile phone into a musical instrument that was developed by Erik Sandelin and Magnus Torstensson from Malmö (Sweden) in 2007. Drawing on field work conducted at a presentation of these mobile phone instruments at a music festival in Sweden in 2007, interviews with the artists (on the day before and the day of the presentation), and complementing this with a variety of material from the project website, I discuss how the 'Pophorns' work, how they have been developed and funded, what design considerations are behind them, and argue that social aspects are are key to 'pophorning'.[55]

55. It is important to note that this is the only case study in a non-English speaking country. Everybody, the artists, the participants (and myself) were non-natives but everybody's English was very good as is typical for (the younger generation in) Scandinavia.

1.1 'Pophorns'

'Pophorns' by Sandelin and Torstensson are a family of musical applications that you can install on your mobile phone. On the project website 'Pophorns' are explained as follows: "A 'Pophorn' is a small program that transforms your mobile phone into a musical instrument. 'Pophorns' acknowledge the mobile phone as a platform for active and social auditory creation, and aim to shorten the distance between pocket and musical action" (Sandelin & Torsensson, n.d.).[56]

Figure 16: The 'Pophorns' on a table at the 'Full Pull' Festival in Malmö

The 'Pophorns' are a family, "a whole series of these small instruments" (Sandelin & Torstensson, 2007a, p. 16'29).[57] The different versions of the 'Pophorns' are: the

56. Both together are 'Unsworn Industries', "an interaction design practice" (Sandelin & Torsensson, n.d.).

57. Where the reference of interview material includes a 'p.' followed by a number, this number refers to the time in the recording of the interview (formatting issue with the reference software).

Ophonine Pophorn, the Boomshakular Pophorn, the Curduroid and the Sunny Pophorn.[58] Each of them is designed to do specific musical tasks; they are "small separated programs, it's not a whole studio where you can do everything" (Sandelin & Torstensson, 2007a, p. 16'29). The software is written in the programming language Java[59] and needs to be downloaded and installed on the phone (more detail see p.109). During the installations process, permissions have to be granted to this 'third-party' software, e.g. to access the recording function of the mobile phone.[60] Originally, there were plans to make the 'Pophorns' software available for mobile phones by various brands, but ultimately it was only developed for specific kinds of 'Sony Ericsson' mobile phones (more detail on the forum, see below). I had to buy a very specific handset (w200i) in order to be able to install and play the 'Pophorns'.

During the interview I conducted with Torstensson and Sandelin in Malmö in 2007, they have an old fashioned horn on the table to start our discussion of the 'Pophorns: "it's like EeeAaa EeeAaa [makes sounds with the horn], it should be an instrument that should be as intuitive to use as these [horns]" (Sandelin & Torstensson, 2007a, p. 17'27). Sandelin and Torstensson explain how design considerations and the name 'Pophorns' are related: "we've been thinking in terms of the distance from pocket to musical action, (...) it's just like pop away and also the horn means phone in south Swedish accent" (Sandelin & Torstensson, 2007a, p. 19'25). Torstensson and Sandelin have a fairly broad and optimistic idea about the distribution and user scenarios for 'Pophorns': "we would like to see them on stage. As well as in fooling around, (...) and in every living room" (Sandelin & Torstensson, 2007a, p. 31'00).

---

58. There is a video featuring all of the Pophorns on youtube (snawbel, n.d.).

59. Java ME for mobile platforms is a popular language for developing mobile phone applications that can run across various mobile phone operating systems (Moritz, 2009).

60. For security reasons, as some malware for mobile phones uses the microphone (and/or camera) of the mobile phone for surveillance of the user.

Figure 17: A young 'Pophorn' player at the 'Full Pull' festival, amidst some of the other projects presented at the venue (see tables in the background)

The four different kinds of 'Pophorns' are called Ophonine, Boomshakular and Corduroid plus one unnamed one. The Ophonine 'Pophorns' works as follows: you start the application on your mobile, then you press the 'cursor' button, and as long as it is pressed down the mobile phone records sound. As soon as you release the button the recording ends, and the recorded sound is automatically played again and again, as a loop (until you record a new sound or quit the application). To give some examples, Sandelin and Torstensson record their own whistling, say 'record a loop' or knock the phone on the table to create a rhythm. The artists have a video on YouTube where they play early prototypes of Ophonines (snawbel, n.d.).

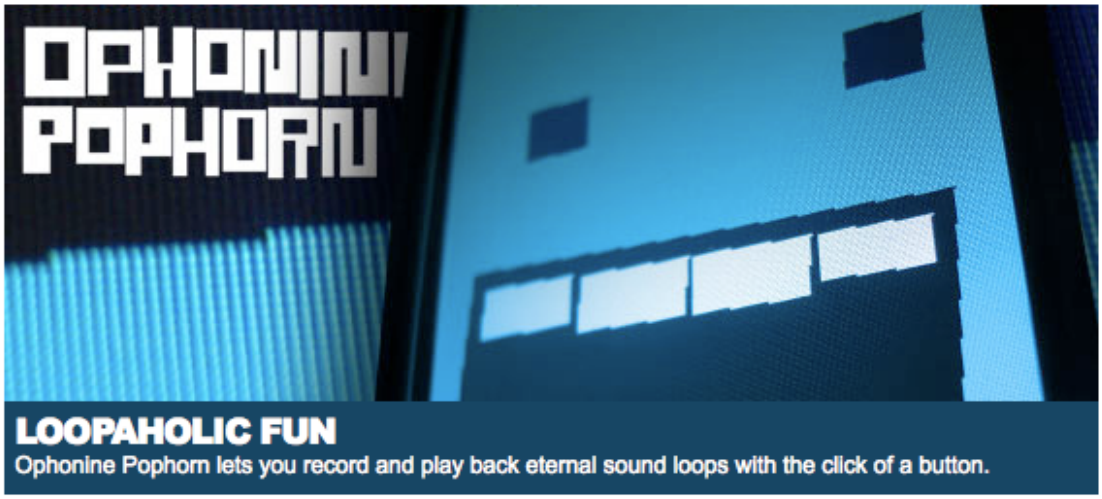


Figure 18: This screenshot shows how the Ophonine 'Pophorn' is advertised on the project website. This comic face is also flashing on the mobile phone screen when this 'Pophorn' is played.

The second version of 'Pophorns' is the Boomshakular Pophorn. The name is inspired by the sound of this Pophorn as Sandelin explains: "you can make Boom Shack [Makes this sound with the phone, imitating a rhythm of bass drum and hi hat]" (Sandelin & Torstensson, 2007a, p. 27'44). Each number key of the mobile phone is assigned a drum sound. When playing this 'Pophorns' you create a rhythm by playing these drums; then you press the star key, and this loops everything you just played: "if you can make drum sounds [showing this to me] and then when you press this it would loop with the same timing" (Sandelin & Torstensson, 2007a, p. 27'44). Basically, the Boomshakular Pophorn is "a little drum box. (...) It doesn't snap to a certain beat. It's kind of hard to play in sync with others. But that's part of what we like" (Sandelin & Torstensson, 2007a, p. 28'08). One unexpected aspect of all versions of these mobile phone instruments is that they do not synchronise with each other, making group performances more challenging, but also potentially more interesting.[61]

61. Torstensson elaborates this decision: "It is a bit hard to defend that decision (...) Because people will always say: Oh it's just because you haven't figured out how to do it. But that's not the reason. Because we really like the way the Ophone sounds [referring to the installation as described below]... sort of ... what is it called... shift kind of in and out of sync and so all different patterns emerge and different

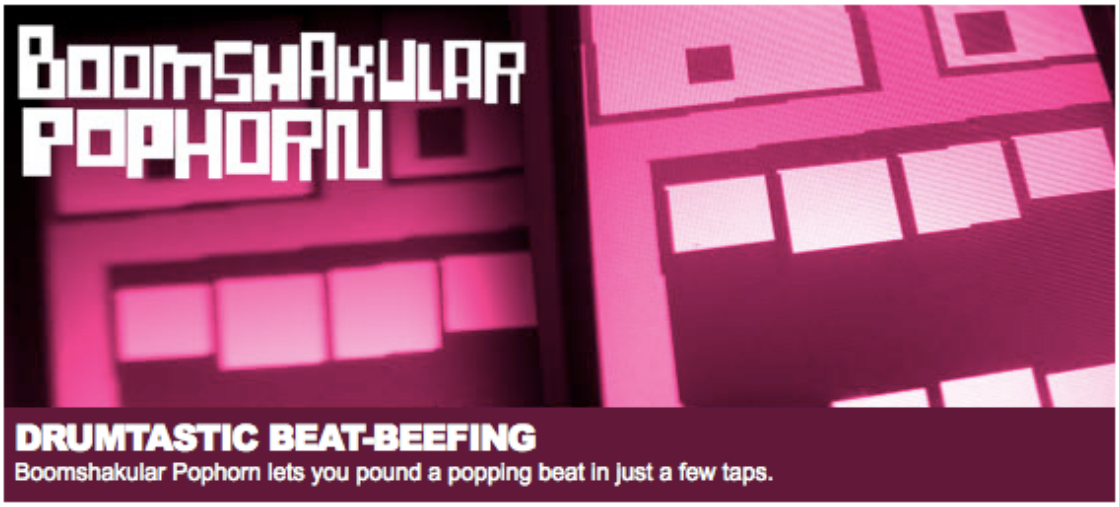


Figure 19: A screenshot of the Boomshakular 'Pophorn' from the project website. This 'face' is also displayed on the mobile phone screen.

A third version, also publicly released, is the Corduroid Pophorn, that works similar to the other ones in that it records a loop. But in this version this loop is made up of the buzzing sound of the vibrating alert of the mobile phone. You press one number button on your phone to create a rhythm (length of button pressed corresponds to the length of the note), and when you play it back (looped) each of the 'notes' is played by the vibrating alert of your mobile. Depending on the surface you put your phone on, you can change the buzzing sound.

---

relationships between different sounds appear. And we really like that aspect. The sort of surprise. The sort of combination of ease of input - it's a very basic simple principle but yet the result is very surprising and ... it is difficult to describe. And this is something we personally enjoy." (Sandelin & Torstensson, 2007a, p. 30'12).

Figure 20: This screenshot shows how the Corduroid 'Pophorn' is advertised on the project website. The mobile phone screen is filled with this 'face' when playing this particular 'Pophorn'.

The fourth 'Pophorn' was still work-in-progress at the time of the interview - and is still not released at the time of writing - and therefore will not considered further in this thesis. Sandelin explains that this forthcoming 'Pophorn' is "a bit like a Theremin, it uses the camera[62] to produce a tone" and "the pitch will just change depending on the brightness of the light" (Sandelin & Torstensson, 2007a, p. 33'04).[63] All 'Pophorns' share certain features and the following sections are concerned with these issues that are relevant to all 'Pophorns'.

In addition to the sounds produced, there is a also a visual part to the instruments. When playing your loop, a large comic-style face flashes in the rhythm of your sound on the mobile phone screen. Each of the 'Pophorns' has an individual 'face' that is displayed when played, as the above figures show (see figure 18 on page 106, figure 19 on page 107 and figure 20 on page 108). Torstensson explains the visual part: "The reason for the characters is that we thought that every individual 'Pophorns' should be recognis-

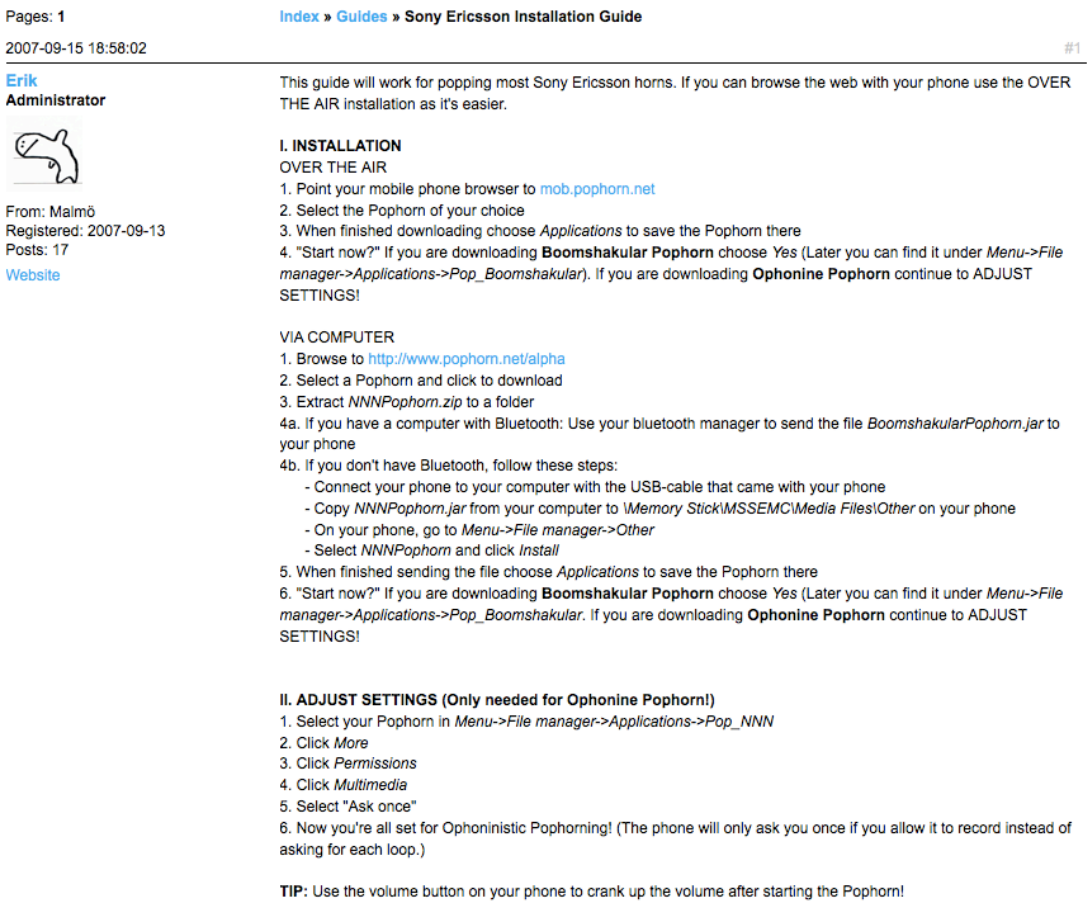
62. "So we try to find ways of use what's unique about the phone, (...) not just reproduce the PC" (Sandelin & Torstensson, 2007a, p. 33'04) It is interesting to note how quickly conceptions of what is unique about mobile phones change, as here the camera function is already understood as an integral part of the device.

63. Similar ideas have been discussed by (Essl et al., 2008).

able. So if you have a lot of phones running you can tell which one is which" (Sandelin & Torstensson, 2007a, p. 24'36). Torstensson and Sandelin are critical about making mobile phone versions of existing music software from the PC world, as those usually suffer from the small screen of the mobile devices. The artists are interested in "the way we use these things [mobile phones] way different than the PC. I don't want to be performing while [gesturing, pretending to stare at the screen] like looking though a microscope" (Sandelin & Torstensson, 2007a, p. 23'00). The idea is that 'Pophorn' players do not need to look at the screen to play them: "we try to actually display things as minimal as possible. Perhaps we don't even need to use the screen. But we want it to be flashing (...) for performative purposes. If you hold it in your hand, you can see some flicking light" (Sandelin & Torstensson, 2007a, p. 23'41). The 'Pophorns' shift the role of the screen from interface to performative display.[64]

Next, I discuss to technical side of the 'Pophorns'. The 'Pophorns' are written in mobile Java and in the interview Sandelin explains that they learned this programming language especially for this project (Sandelin & Torstensson, 2007a, p. 14'50). Users can download the 'Pophorns' directly onto their phones or via their computers. After purchasing one of the mobile phone models that are compatible with the 'Pophorns' in 2007, I tried to install it directly via mobile Internet, but it did not work. I had to download the application to my computer and then transfer it to my mobile phone, as explained in the installation guide on the 'Pophorns' website (see figure 21, page 110).

64. I will extend this discussion of the relation between visuals and sound in mobile sound art in the following chapters, when discussing the visual interface in the 'Aura' chapter (section 'Mobile Tactics and Polyphonies of Footsteps', p. 193ff.), and when discussing the use of the mscape software in the 'Core Sample' chapter (section 'Screens and Walking', p. 254ff.), illustrating how the mobile context intensifies the problematic of visual interfaces for music making.



Pages: **1**

Index » Guides » **Sony Ericsson Installation Guide**

2007-09-15 18:58:02 #1

Erik
Administrator

From: Malmö
Registered: 2007-09-13
Posts: 17
Website

This guide will work for popping most Sony Ericsson horns. If you can browse the web with your phone use the OVER THE AIR installation as it's easier.

I. INSTALLATION
OVER THE AIR
1. Point your mobile phone browser to mob.pophorn.net
2. Select the Pophorn of your choice
3. When finished downloading choose *Applications* to save the Pophorn there
4. "Start now?" If you are downloading **Boomshakular Pophorn** choose *Yes* (Later you can find it under *Menu->File manager->Applications->Pop_Boomshakular*). If you are downloading **Ophonine Pophorn** continue to ADJUST SETTINGS!

VIA COMPUTER
1. Browse to http://www.pophorn.net/alpha
2. Select a Pophorn and click to download
3. Extract *NNNPophorn.zip* to a folder
4a. If you have a computer with Bluetooth: Use your bluetooth manager to send the file *BoomshakularPophorn.jar* to your phone
4b. If you don't have Bluetooth, follow these steps:
- Connect your phone to your computer with the USB-cable that came with your phone
- Copy *NNNPophorn.jar* from your computer to *\Memory Stick\MSSEMC\Media Files\Other* on your phone
- On your phone, go to *Menu->File manager->Other*
- Select *NNNPophorn* and click *Install*
5. When finished sending the file choose *Applications* to save the Pophorn there
6. "Start now?" If you are downloading **Boomshakular Pophorn** choose *Yes* (Later you can find it under *Menu->File manager->Applications->Pop_Boomshakular*. If you are downloading **Ophonine Pophorn** continue to ADJUST SETTINGS!

II. ADJUST SETTINGS (Only needed for Ophonine Pophorn!)
1. Select your Pophorn in *Menu->File manager->Applications->Pop_NNN*
2. Click *More*
3. Click *Permissions*
4. Click *Multimedia*
5. Select "Ask once"
6. Now you're all set for Ophoninistic Pophorning! (The phone will only ask you once if you allow it to record instead of asking for each loop.)

TIP: Use the volume button on your phone to crank up the volume after starting the Pophorn!

Figure 21: This guide explains how to install the 'Pophorns' on specific Sony Eriksson mobile phones

The artists provide a 'basic' version of the 'Pophorns' software and then hope that people (with the relevant skills) will be able to adjust the code for other mobile phones. The 'Pophorn' website and its forum are meant to be a space to share this information with other people: "we hope people will try to get it installed on different phones and then report what went wrong and perhaps also provide some workarounds" (Sandelin & Torstensson, 2007a, p. 37'53). Sandelin and Torstensson specify this idea and add that they are hoping for stories[65] from users:

> We're going to release the three first 'Pophorns' this September [2007]. (...) But it's not going to be a public release (...). So far we have 30, 40 people interested. (...) So we are going to send them a secret link and then they can try it out and we hope to get debug info. But also (...) we want stories back! Films from when they are using it in ways that we can't imagine. (...) We're

65. In fact, the 'stories' section of the 'Pophorns' forum remained empty (Sandelin & Torsensson, n. d.).

> curious what people can come up with. (Sandelin & Torstensson, 2007a, p. 38'55)

Overall, the artists are "trying to think how we can make it as easy as possible" to install the 'Pophorns' but still they have to provide a website to explain the process and they also rely on technology-savvy people to help implement the 'Pophorns' on different types of mobile phones (Sandelin & Torstensson, 2007a, p. 35'18). This highlights again the issue of access for mobile phone art projects.

How did Torstensson and Eric fund the development of the 'Pophorns'? The artists first looked to the industry for interest and funding for developing the 'Pophorns' but then pursued it as independent project. From the interview with Torstensson and Sandelin, as well as from conversations I had with several mobile sound artists and designers in the early and mid 00s I learned that they often contact mobile phone companies (that always claim to be looking for 'killer applications') but these companies are usually not interested in the suggested projects and rarely support them. Torstensson thinks there would be commercial opportunities if this was they way they wanted to go: "If I was a mobile phone company, and it's like we can turn your phone into a great, cool musical instrument. I mean there are so many opportunities" (Sandelin & Torstensson, 2007a, p. 14'50).

In the end they went ahead almost without support from the industry, as Torstensson states: "We discussed it a bit with mobile phone companies and they were interested but they were not really. [It] seemed like a really slow process" (Sandelin & Torstensson, 2007a, p. 12'05). Sandelin also express how they feel ambivalent about having the 'Pophorns' in a commercial context: "Because somehow we don't see this as an application that's on the same 'add page' as all the ringtones and.... or maybe it could be. We haven't talked about this" (Sandelin & Torstensson, 2007a, p. 14'50). The only industry

support they received was some phones: "these [mobile phones] were actually donated by Sony Ericsson (...) in Columbia" (Sandelin & Torstensson, 2007a, p. 26'33). They won a (relatively small) scholarship to develop the project further, (see Sandelin & Torsensson, 2007a). The financial context of the 'Pophorns' is in stark contrast the the second example I am using in this chapter, the smule applications, as will be discussed later.

The 'Pophorns' do not take advantage of the network connectivity of mobile phones; they would work even without any reception. But this is also true for many other ways mobile phones are used such as taking photos or gaming. For the designers this local use is crucial: "That is another important aspect to us, that it is local, [he is looping this statement on a 'Pophorn'] the local, social attitude. I mean phones are mostly for communication across distances. But you see a lot of people hanging out at street corners and just listening to mp3s and stuff" (Sandelin & Torstensson, 2007a, p. 25'46).

Figure 22: ' Ophones' exhibited in Copenhagen, at Lobbyen/Plex Musikteater in September 2007. You record a loop by pressing the button on the telephone receiver; this loop is then played back on the connected speaker.

Prior to developing the 'Pophorns',' Sandelin and Torstensson had been working on a project called 'Ophones', an interactive sound installation with a traditional telephone interface that was exhibited internationally (see figure 22, page 112). Key reasons for moving from the 'Ophones' to the mobile platform and the 'Pophorns' were their desire to integrate the musical telephone performance into everyday contexts and to reach a wider audience. They aimed to move from the gallery and festival setting to the everyday life context: "by doing these cell phone Ophones we thought we might bring this experience to everyday life in a way" (Sandelin & Torstensson, 2007a, p. 04'08). The artists regretted that they "haven't been able to live with the Ophones, that's something we would be interested in seeing how it would actually be to have Ophones around (...) always" (Sandelin & Torstensson, 2007a, p. 03'26). Another concern of the artists is to reach a broader audience, to "bring it to more people" (Sandelin & Torstensson, 2007a, p. 04'08). This case study, as many other examples of mobile (sound) art, aims to access a broader audience by choosing mobile phones.

1.2 Scenarios for Playing the 'Pophorns'

Sandelin and Torstensson envision four scenarios for playing the 'Pophorns': small-group non-expert musical performance, larger group public demonstrations, the use of 'Pophorns' in professional musical performance and a more individual use for 'sonic pranks'. The small group performance seems to be closest to their hearts. Sandelin states: "[I]t's much more fun when you're more people" (Sandelin & Torstensson, 2007a, p. 24'36). I ask the artists about the group size they envision. They are not very specific in their replies but it seems that small group performances ("three...four...") are best suited for the 'Pophorns'. They recall some performance situations with groups: "We had a group of, I think there were like seven young kids and they were sharing three 'Pophorns'. (...) I think they all had the sensation that they were all in charge and

contributing. (...) They were sort of passing it on" (Sandelin & Torstensson, 2007a, p. 51'56). Children as an audience seem to have been most successful so far, I gather from the interviews and the website (see also figure 17, page 105 and figure 24, page 116). Sandelin hopes "that a lot of kids will use the 'Pophorns', because I think they could do really cool stuff" (Sandelin & Torstensson, 2007b, p. 19'09). He also recalls: "Now I realise, in Columbia we were doing a whole exhibition, like two hours just kids playing with the Ophonine. It was like this kids workshop as part of the Bogotrax festival. I think they liked it" (Sandelin & Torstensson, 2007b, p. 15'30).

The second scenario for the 'Pophorns' are public Performances of the 'Pophorns', where larger numbers participate. It is 'new' to make music with these mobile telephones, and the public 'Pophorns' performances show how this works. Sandelin and Torstensson have presented them at festivals, as a kind of public installation or performance. For example, Sandelin had been invited to two festivals in Columbia, 'Bogotrax' in Bogota and 'Pixelache' in Medellin (2007). At the public 'Pophorns' performance in Bogota Sandelin and Torstensson connected the Ophonine 'Pophorns' to an amplifier and speakers. Sandelin recalls: "People normally, (...) don't voice [their] opinion publicly. (...) And a lot of people were recording criticism towards the [local] government. So if you're doing it through a phone, maybe it feels like something changes" (Sandelin & Torstensson, 2007a, p. 12'05).[66] The below figure (figure 23, page 115) shows a similar set-up (to the one in Bogota) at the festival in Medellin.[67] Torstensson and Sandelin recall that there were about 200 people on the square and "of course they weren't really used to this set-up that you have to provide some input yourself. But then when there were less people more people dared to try" (Sandelin & Torstensson, 2007a, p. 12'05).

66. I will return to this specific aspect in next chapter '"Small Texts"?: Text Messages, Art and Public Spheres' (p. 150ff.).

67. There is also a video of the Medellin 'Pophorn' event (snawbel, n.d.).

The duo also had several events in Sweden. One of them a "a busy 'Pophorns' jam at Herrgården in southern Malmö" (Sandelin & Torsensson, n.d.) in summer 2008 (figure 24, page 116), of which participating children have shot and edited a video (drakirr, 2008). The presentation at the Full Pull festival in Malmö in 2007, where I experienced the 'Pophorns' was also a public demonstration of them.

Figure 23: A public 'Pophorns' Performance at a festival in Columbia (2007). The audience is invited to play the 'Pophorns' that are connected to a sound system

Figure 24: Children are playing the 'Pophorns' at a 'jam' in Sweden (2008)

The third scenario for the 'Pophorns' is for them to be played by performers on stage as the designers hope to see them used "at least occasionally on stage or recording music or thinking of new musical concepts" (Sandelin & Torstensson, 2007a, p. 31'00). They report that "there is this musician in New York that really wanted to use one 'Pophorn' in a performance" (Sandelin & Torstensson, 2007a, p. 31'00). This musician is called 'Bora Yoon' and did eventually use it in a performance in New York (For more detail see Sandelin & Torsensson, 2007b). This performance is discussed in the Wall Street Journal:

> Cellphones are a notorious audience distraction at musical performances -- ringing, buzzing and beeping and giving conductors fits. But for some avant-garde electronic artists, cellphones themselves are musical instruments that can be incorporated into rock, hip-hop and even modern classical music. (Sharma, 2007)

Figure 25: 'Pophorns' in a concert performance in New York City (2007)

The fourth and last scenario for using the 'Pophorns' is the everyday environment. Torstensson imagines: "sonic pranks" where "you just record someone talking and sneak up to someone [he enacts this in the background with one of the 'Pophorns'] if they say something really stupid maybe. [He records this sentence and loop-playbacks it on the 'Pophorn': If I say something really stupid]" (Sandelin & Torstensson, 2007a, p. 19'25). And Sandelin adds: "We want to leave it open for that sort of sonic play" (Sandelin & Torstensson, 2007a, p. 19'25). Torstensson hopes for the future: "what I'd really like to see people just enjoying a 'Pophorn' while riding the bus home from work or to school or something. And then sort of meeting with friends and: "Ahh... let's Pophorn" (Sandelin & Torstensson, 2007b, p. 31'00). He thinks of these everyday uses as improvisations that can happen however people please.

After distinguishing between four 'Pophorn' scenarios - small group performance, public performance, stage performance and everyday environment - I discuss my own

experience of the 'Pophorns'. I have lived with three 'Pophorns' on my mobile phone for more than three years (since 2007), but in reality I have rarely played them. In my experience it is not very satisfying as an individual musical instrument played in an everyday context. Whenever I played the 'Pophorns' and other people were around, we agreed that it would be fun if they could join in and 'jam' with me, but the individual instrument did not hold anyone's attention for long. Small group performance would be more engaging, but due to the limitations of needing specific mobile phones, others were not able to install the 'Pophorns' on their handsets.

I did encounter a small group performance of 'Pophorns' and also a public demonstration of them at the 'Full Pull' Festival where the main field work for this case study was carried out. Sandelin and Torstensson presented the 'Pophorns' at this music festival in Malmö (Sweden) on the 8th of September 2007. I conducted an hour-long interview with both artists on the 7th of September. The next day, the 'Pophorns' were presented at the festival, and I interviewed the artists again.[68]

The 'Full Pull 07' festival "presents two nights at Inkonst with experimental music, visuals and interactive media" (Holmberg, Melinder, & Moulettes, n.d.). The main part of the festival consisted of concert performances but it also featured several sound installations and mobile phone projects. Many sound projects were set up in the same room and time slots were given to each of them to present to the public. In one of them, Sandelin and Torstensson explained and played the 'Pophorns' in front of the festival audience. As this part of the festival evening started relatively early (before the more concert-like stage performances) the crowd was not too large. In between these present-

68. I also videotaped the event and took photographs and field notes. I observed people trying out the 'Pophorns' and interviewed two of the participants trying out the 'Pophorns' (these interviews were not productive for this written analysis). On the same evening, after the presentation and trying out phase was over, I interviewed the artists again. Both artist interviews have been used throughout this chapter.

ations, the about half a dozen sound projects were all running at the same time: the sound was cacophonous.[69] The audience was invited to wander around and to try out the sound installations and the mobile phone sound projects, as can be seen in figure 16 (page 103) where the 'Pophorns are presented on a table. During the two hours several people walked up to the table to try out the 'Pophorns'; the majority were in their 20s or 30s, but one child played for longer than most (see figure 17, page 105).

At one point a small group of people with 'Pophorns' congregated in one corner of the room, and joined another group that were playing 'IMPROVe' by Zeenath Hasan and Richard Widerberg (see p. 63), a mobile sound art project that was also presented on the same evening. This small group performance seemed to be the most engaging for the players, and this 'jam' session lasted for about 15 minutes (whereas individual players for the most part only spent a minute or two with the 'Pophorns').

Overall, this section has shown that key parts of playing the 'Pophorns' are social aspects, as shown by the importance of small group performance. The aim of Sandelin and Torstensson to reach a broad audience and to infiltrate everyday life contexts is a key part of the concept, but does not appear to have actually happened. From my field research and the 'Pophorn' website it appears that the 'Pophorns' have been mainly played at events organised by the artists. Public demonstrations where the artists showed how mobile phones can be used for music making also proved to be a key aspect of 'Pophorning'.

69. These observations are drawn from my field notes, 8th September 2007.

2. The Early Musical Days of the Telephone

'Pophorns' use the apparatus of the telephone, specifically mobile phones as a musical instrument. In the press, and also by many developers and artists it is often billed as 'new' to make music on the telephone (see p.72 ff.). In this section of the chapter I work with the concept of media archaeology to critically interrogate these claims (see also p.99).

The telephone as a musical instrument is not new, it is a re-occurring topos, a cyclic theme. Huhtamo mentions the sense of deja-vu one experiences when encountering one of these topoi in media history, examples of a cyclical, not linear development (Huhtamo, 1997, p. 222). I had one of those deja-vu moments when after my initial fascination with the 'new' way of using mobile telephones as musical instrument, I researched the history of the telephone and realised that its early days were actually very musical ones. Huhtamo defines media archeology as "as a way of studying recurring cyclical phenomena that (re)appear and disappear and reappear over and over again in media history" (Huhtamo, 1997, p. 222).

Working with Huhtamo's concept, this chapter aims to facilitate a "conversation" between the telephone's "past(s) and its present" by discussing several examples of musical use of the telephone from recent years and from the early days of the telephone (Huhtamo, forthcoming, pp. 2-3). In an earlier formulation of his approach Huhtamo defines two goals for media archeology: "first is the study of the cyclically recurring elements and motives underlying and guiding the development of media culture" (Huhtamo, 1997, p. 223). Translated for the recent buzz around mobile phones as mu-

sical instruments as 'new', it is my task to look back into telephonic history to see if this is the first time that telephones are used in musical ways, and if this has been described as 'new' before. For Huhtamo, the second aim of media archeology is "the 'excavation' of the ways in which these discursive traditions and formulations have been "imprinted" on specific media machines and systems in different historical contexts, contributing to their identity in terms of socially and ideologically specific webs of signification" (Huhtamo, 1997, p. 223). This part is more concerned with the material evidence and their social and cultural context. I need to take into account how these past discourses around musical uses of the telephone might have shaped today's discourse around mobile phone instruments, and the very devices used for musical activities. According to Huhtamo, "[a]n artwork can function as a site for re-enacting and unravelling discourse constellations of media-cultural relevance" (Huhtamo, 2004a), and this chapter is aiming to do so for the musical discourse around the telephone.

I return to media archeology momentarily to untangle a little bit further how and why this concept provides a way to understand the connection between 'Pophorns' and the musical use of the telephone in the 19th century. Huhtamo and Parikka's 'An Archeology of Media Archeology' stresses that the emerging media archeologies are "a bundle of closely related approaches," not a fixed field (Huhtamo & Parikka, forthcoming, p. 3).[70] At its core however, media archeology allows us to "construct alternate histories" by "rummag[ing] textual, visual and auditory archives as well as collections of artifacts, emphasising both the discursive and the material manifestations of culture" (Huhtamo & Parikka, forthcoming, p. 3). The authors credit Jacques Perriault with coining the term in 1981 (Huhtamo & Parikka, forthcoming, p. 3).[71] Kittler's type of media arche-

70. The authors kindly shared pre-print versions of these forthcoming publications with me.
71. While earlier Huhtamo claimed the term as his own (Huhtamo, 1997, p. 221).

ology - though he does not subscribe to the term media archeology himself (Huhtamo & Parikka, forthcoming, p. 10) - is discussed as a representative of the "media materialist" (Huhtamo & Parikka, forthcoming, p. 6) or "techno-hardware approach of German scholars" (Huhtamo & Parikka, forthcoming, p. 9), with the more "socially and culturally oriented contributions" from the Anglo-American area positioned on the other end of the spectrum (Huhtamo & Parikka, forthcoming, p. 9).

Huhtamo's approach aims to establish a specific way of doing media archeology by identifying and following topoi throughout media history (Huhtamo, forthcoming). His media archeology draws on the historic development of topos studies and applies them to media culture. He summarises his concept of media archeology:

> Media archaeology means for me a critical practice that excavates media cultural evidence for clues about neglected, misrepresented and/or suppressed aspects of both media's past(s) and its present, and tries to bring these into a conversation with each other. It purports to unearth traces of lost media-cultural phenomena and agendas, and to illuminate ideological mechanisms behind them. It also emphasises the multiplicity of historical narratives and highlights their constructed and ideologically determined nature. (Huhtamo, forthcoming, pp. 2-3)

Huhtamo has carried out a 'mobile' version of his media archaeology, which I first encountered as a keynote at ISEA 2004, a shortened version of it (Huhtamo, 2004b) mainly discusses the eventual uptake of the wrist watch and the early days of mobile photography; and a more detailed version of this paper (Huhtamo, forthcoming) also mentions audio media such as the portable radio and ipods. To structure these first ideas towards an archeology of mobile media, he distinguishes between portable, wearable and vehicle-mounted media.

He aims to show how our obsession with 'new' mobile media has in fact a long history that is just largely forgotten: "Look for words like 'mobile', 'portable', 'wearable', 'nomadic' in any standard media history. Be ready for a surprise: they are not there"

(Huhtamo, 2004b). And the task of his talk "is nothing less than uncovering the 'hidden' histories of mobile media – to the extent that they existed, that is" (Huhtamo, 2004b).[72] This pre-history of mobile media is relevant for all work in the area of mobile media, and provides relevant context for this thesis.

Several other existing media-archaeological works are relevant for this thesis: media archeologies in the area of networked media, such as Standage (1998) who argues that the Telegraph operated as a kind of Victorian Internet, media archaeologies in the area of sound (Kahn, 1999; Sterne, 2003; Thompson, 2004), and of mobile sound (Schiffer's (1992) history of the portable radio). But here, there is only space to focus on a specific selection of media archaeologies, namely contributions to the media archaeology of the telephone such as Ronell's (1989) *Telephone Book*, an experimental book echoing the form of a switchboard where she asks us to “read with your ears”; Brigg's chapter on the telephone broadcasting services (1977), and Marvin who claims that the fuzz about new technology follows always a similar structure that is ‘characteristically modern" (1990, p. 3). For her, the telephone is one of the five "proto-mass media" invented in the late nineteenth century, alongside the "phonograph, electric light, wireless and cinema" (Marvin, 1990, p. 3). I draw on all these existing media archaeological works regarding the telephone and focus on the musical side of telephonic history. In addition to finding parallels between the musical use of the telephone over time, it is also important to point out what is different in telephone and mobile phone musical use, where the ruptures and discontinuities are.

---

72. Tofts also sketches a historic context for mobile art: "It has a long history that spans the performance of 15th century mystery plays on the backs of horse-drawn carts, the travelling minstrels of the Renaissance, Duchamp’s Boîte-en-valise, touring blockbuster exhibitions, the ‘dial-a-poem poets’ and mail art of the 1960s, the urban programming of hip hop into the 80’s sensibility with Ghetto blasters and, most recently, the iPod’s ricorso of the not-so-silent revolution of personal, customised sound" (Tofts, 2007).

Time to move from the concept of media archeology back to the relationship between music making and telephones: Telephone music is not as new as many might think. For example, we can find resonance between the contemporary telephone demonstrations of the 'Pophorns' at the festivals in Columbia and Sweden (see p.114) and the way Alexander Graham Bell and his contemporaries demonstrated and performed music via telephone for the public in the 19th century (see p.126).

Discussing the origins of the term 'Telephone' Young (1991, p. 2) states that "early associations were with music" and he lists several devices that were used to produce loud sounds, for examples fog horns on ships that were called 'Telephone' (see figure 26, page 124). This non-electric fog-horn-like device transmitted information via sound signals and could be understood as another musical footnote of telephonic history as it seems to have operated in a similar fashion to Russolo's 'intonarumori'.

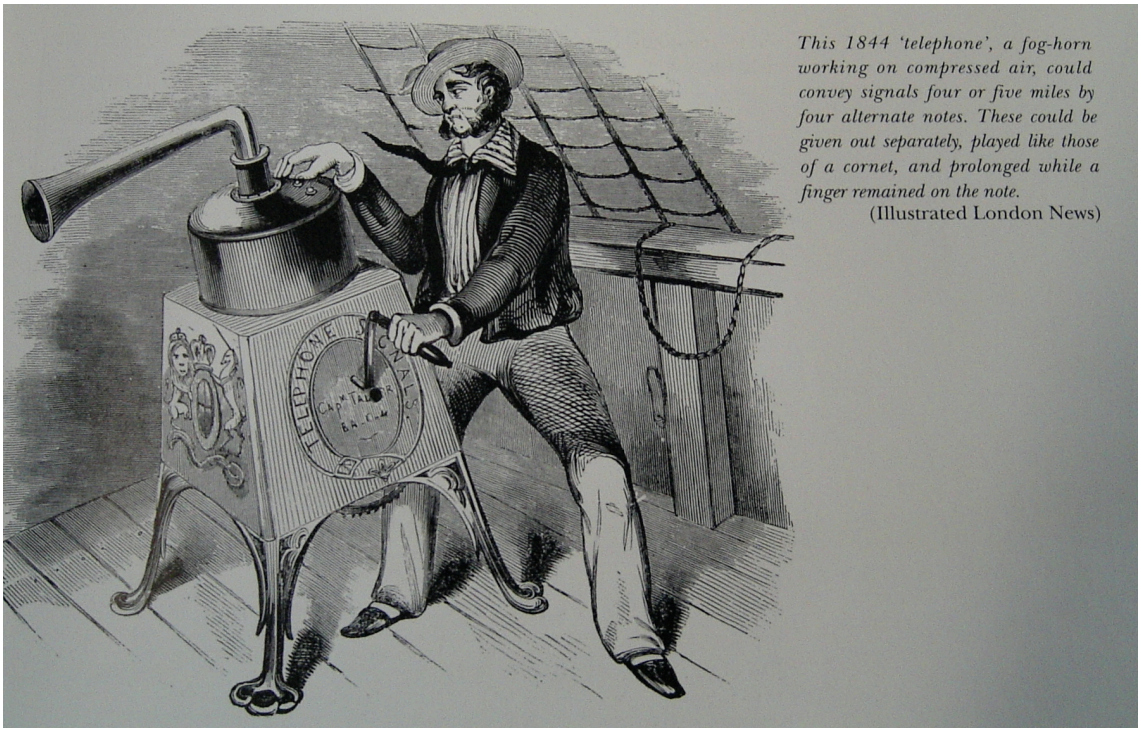


Figure 26: The Fog-horn 'Telephone' (1844)

The invention of the telephone has been a longer process and although Alexander Graham Bell tends to be given prominence, others also need to be credited (Aronson,

1977; Young, 1991; Weidenaar, 1995), including Gray's patent for the 'Electric Telegraph for Transmitting Musical Tones' (1875) and his public concert with it in 1877 is often credited as the first "concert of electronic music" (Jerusalem, n.d.).

Figure 27: Gray's 'Electric Telegraph for Transmitting Musical Tones' (1875)

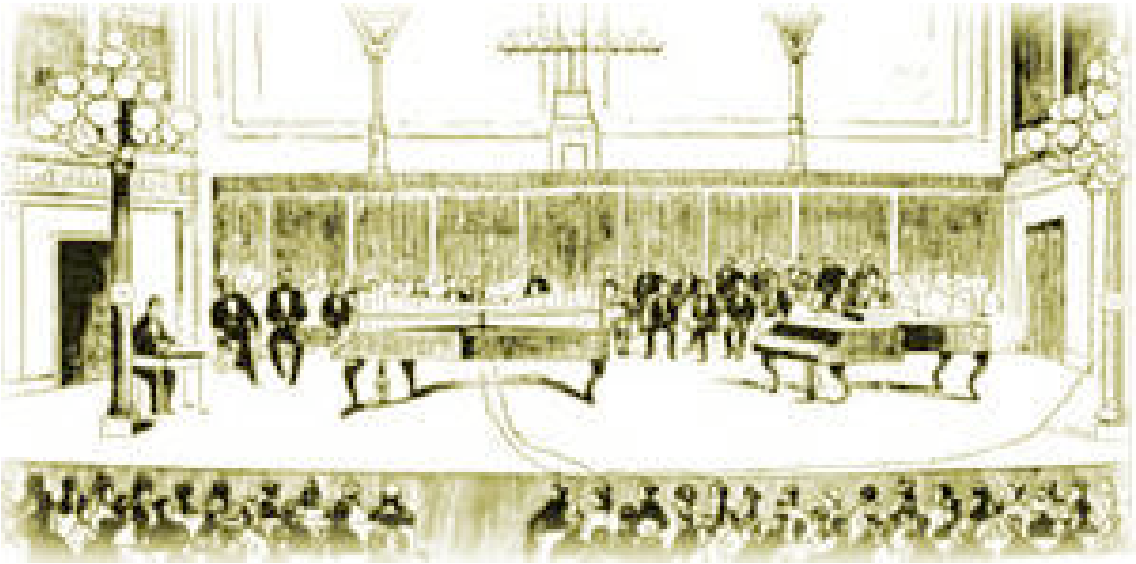


Figure 28: A concert with Gray's 'Musical Telegraph' in 1877

After Alexander Graham Bell had secured the Telephone patent in 1876 and developed it further, he needed to convince the public that this was a useful invention, in a time when most people found that the Telegraph served their long-distance communication needs nicely; and he chose public musical performances to make his case. Public performances of the telephone took place from the year of its invention on. For these occasions one would have expected that Bell demonstrated to the public how this new device enabled to transmit spoken information to a distant place. But in fact the inventor's and his assistant's stage performances transmitted music from one place to the other: "Bell and Watson staged a series of double acts, with Watson some miles away bellowing and singing to the audience in the lecture hall. The favourite song with the audience was Do Not Trust Him, Gentle Lady" (Young, 1991, p. 10).

Already for the first presentation of his invention, at a meeting of the American Academy of Science and Technology in 1876, he chose to transmit music, the song 'Old Hundred' played by an organ in his remote office. In the following year Bell and Watson were touring the US doing these presentations of "Bell's speaking and singing telephone" (Fischer, 1992, p. 35). Some of their performances even included a singer, brass band and a cornetist (Aronson, 1977, p. 21) and on one occasion bishops and priests in the audience spontaneously sang back through the telephone when they heard a voice singing from the other end of the line (Fischer, 1992, p. 61).

Aronson (1977) gives two reasons for Bell's telephone music events. First, the inventor had worked on improving the phone's quality by building separate receivers and transmitters, with the result that it was not possible to transmit and receive with the same device. The second reason was that Bell needed money and the telephone performances were an opportunity for him to earn some, and he continued the performances even after two-way-communication over telephone was possible by autumn 1876.

Briggs describes how “telephone concerts” were promoted where young ladies sing popular songs to private homes and “central premises”, which could even be in other towns (Briggs, 1977, p. 42).

The use of the telephone as a communication technology was not apparent for most people at the time when the telephone was invented as everybody was used to the telegraph for this purpose. Even the director of a big telegraph company dismissed the ideas as "electrical toy" (Aronson, 1977, p. 16). In order to find subscribers for the telephone to make his business successful, Bell needed to educate the public about his invention. Fischer gives detailed descriptions how salesmen travelled from town to town demonstrating the telephone, often using similar events as Bell to persuade new telephone customers: "they often unveiled in flamboyant demonstrations, usually involving the broadcast of music and speeches from one place to an audience in another" (Fischer, 1992, p. 61). In those times it was not unusual to have stage events for new technological inventions. Marvin (Marvin, 1990), for example, describes Bell’s performances alongside public stage events featuring electricity, by drawing on a vast number of articles that covered these events in the 19th century.

Another musical use of the telephone during its early years is reported via its switchboards. In the first decades of the telephone, to call another party, subscribers had to call the switchboard first, where they would talk to one of the *Hello Girls* (Martin, 1991) and ask to be connected to the desired person. Initially these switchboards were quite small and people would know each other; later they employed a significant number of people, mostly women. An example of musical use of a switchboard is described by Young: In 1886 Charlie Tilley worked in for a switchboard in Vancouver and "in the evenings he entertained subscribers with his guitar and some friends 'broadcasting' hits

such as 'The Old Folks At Home', 'Salomon Levi' and 'God Save The Queen' " (Young, 1991, pp. 23-24).

Another anecdote of this kind is discussed by Marvin: "Informal entertainments were sometimes spontaneously organised by telephone operators during the wee hours of the night, when customer call were few and far between. On a circuit of several stations, operators might sit and exchange amusing stories" (1891, p. cited in:) (Marvin, 1990, p. 212). Operators from several East Coast cities and towns in the US organised their own telephone music concert in 1891, as Marvin quotes from the 'Boston Evening Record'[73] about this telephone concert:

> The operator in Providence plays the banjo, the Worcester operator the harmonica, and gently the others sing. Some tune will be started by the players and the others will sing. To appreciate the effect, one must have a transmitter close to his ear. The music will sound as clear as though were it in the same room. (Marvin, 1990, p. 212)

Another way of using the telephone for musical entertainment were the so-called “party lines”. Especially in rural areas it was common to share a telephone line with several neighbours. The concept of phone calls as intimate and private had not yet been established, as the shared line meant that other people could overhear conversations. On the other hand, what at first sight seems to be a limitation of phone technology, was actually made fruitful by the subscribers of party lines. As farmers would gather around their phones in the evening to exchange news and gossip (de Sola Pool, 1977, p. 6) these rural party lines served a similar purpose as Internet chats. And the possibility to talk to more than one party at the same time was not available later on, until the invention of conference calls in the 1970s.

---

73. the text indicates the 'Boston Evening Record' as source (without further detail), while the corresponding endnote lists the article "Concert Music" in the Scientific American, October 10 1891, p225.

A further musical use of the Telephone were radio-like broadcasting services in Paris, London, Budapest and many other cities during the first decades of the 20th century, where people would often listen to the transmissions in social settings, for example with multi-user receivers (Briggs, 1977; Marvin, 1990; Young, 1991).

So far, I have considered the very early days of the telephone and its musical uses, and the most recent times with mobile phone musical instruments. But the topos of the musical telephone has also been re-occurring in between, namely in the 1980s. Robert Adrian was one of the artists involved with using telephones for musical ends in this decade and he defines 'Telephone Music' as follows:

> Music played into the telephone is TELEPHONE MUSIC because, no matter how rich and wonderful the music is when it goes into the telephone, when it emerges a hundred, a thousand, ten thousand kilometres away it will be telephone sound. The narrow band of frequencies available in the Telephone (the price of its cheapness and universal availability) means that everything that goes into the telephone comes out as telephone sound. In a concert of TELEPHONE MUSIC the instrument is the telephone itself. (Adrian, 1983)

For the piece 'Telephone music' (1983) artists in Vienna, Budapest and Berlin connected their amplifiers to their telephones and played live music to each other for two hours. (Adrian, 1995) Berlin and Budapest were called from Vienna, because the sponsor came from there. Each participant played for about 20 minutes. The sound was received in Vienna and then transmitted to the third party via an additional phone line. The sounds from Vienna were transmitted to the other two cities via two more lines. A "3-way jam session as a kind of improvised telephone conference" was the result. The aim was to use the telephone, the most universal electronic communication technology, to create a space for artists. They wanted to work together over geographic and ideological boundaries (Braun, 1999). Popper (1993) criticises the setup as it was not really used in an interactive way, but for a "more conventional transmission of prepared works". But as with all installations and interactive art works, it is not so much the content that counts,

but the event itself. Taking into consideration the limited awareness of telephone art it is astonishing to find that one of the standard music encyclopaedias in Germany, the *Brockhaus Musik* (Brockhaus, 2001, p. 786) lists the term telephone concert, and explains it as a term used since the 1980s to describe concerts that are transmitted via telephone and for remote musicians playing together via a satellite connection.

Overall, this section has discussed how in the early days of the telephone public performances were often used to demonstrate the use of this 'new' apparatus - and these public performances were often musical ones. The phone did of course eventually become very popular and part of everyday life - not in its musical function, but as a voice communication media. For the 'Pophorns' (as discussed in the previous section) this is different: The mobile telephone does not need to be presented to the public, it is part of everyday life already. But the musical use of this apparatus *does* need to be demonstrated to the public as it is rare - and perceived as 'new'.

3. The iPhone 'Ocarina'

Section three and four of this chapter develop a second musical theme of the telephone - using the telephone network as musical instrument. Before exploring the historic aspect of this theme in section four, this third section of the chapter discusses the musical instrument 'Ocarina' for mobile phones that allows players to perform for remote audiences - and we are now back in the 21st century. The 2007 example 'Pophorns' and other artistic and academic examples of mobile phone instruments from the last eight years stayed very much in their contexts and did not break into popular culture as many of them had hoped. In 2009 mobile phone instruments seems to have arrived in popular culture, actually becoming part of people's everyday lives, as we can see from the popularity of the iPhone 'Ocarina', as discussed in this section.

For this case study, I learned to play the 'Ocarina' on my iPod touch, read relevant press articles, researched the forums where 'Ocarina' players share their experience, watched YouTube videos of other people playing the 'Ocarina', and read websites of the makers. The YouTube videos of 'Ocarina' players recording themselves are of interest, however, recording for the internet is always a default set-up, with a webcam in front of the computer. This is at odds with my interest in the fact that players are not required to sit in front of a computer when using their mobile phones. However, the YouTube videos, the forum comments and blog comments by 'Ocarina' players do give an insight into the perspective of the players, as discussed below.[74]

74. As this section is an update of the earlier case study 'Pophorns' that happened very much towards the end of the writing of this thesis there was not enough time to conduct an in depth case study of 'Ocarina' players, but this is an option for future research.

The 'Ocarina' is an iPhone application that can be downloaded to specific mobile phones - iPhones (by Apple)[75] - and allows the users to play their phones in a similar way as a traditional ocarina. Familiarity with older and cheap musical pipe instruments means people intuitively understand how to use this, using the microphone as 'mouth-piece' and graphics on the touch screen as 'finger holes' (see figure 29, page 132 and figure 30, page 134). The 'Ocarina' was released on 6th November 2008 (The Mule, 2008d) (and since March 2009 it also works on the iPod touch, which is - possibly the future of mobile phones - an iPhone minus the telephone function). The designer Ge Wang explains the interface for playing: "'Ocarina' is sensitive to one's breath (gently blowing into the microphone controls intensity), touch (via a multi-touch interface based on the 4-hole English Pendant 'Ocarina'), and movement (dual axis accelerometer controls vibrato rate and depth)" (Wang, 2009, p. 303).

Figure 29: Ge Wang playing the iPhone 'Ocarina' by blowing into the microphone and placing fingers on the touch screen

75. See (Goggin, 2009) for an overview of the iPhone and app history from a cultural studies perspective.

Taking advantage of the networked capabilities of the mobile phone, the 'Ocarina' also provides a networked element: "'Ocarina' is also a unique social artifact, allowing its user to hear other 'Ocarina' players throughout the world while seeing their location – achieved through GPS and the persistent data connection on the iPhone" (Wang, 2009, p. 303). Another aspect of the 'Ocarina' is a web portal where players can share scores and other information.[76] The 'Ocarina' application proved to be very popular: "Within four days of its release, it became the No. 1 best-selling app on the [Apple app] store'," Wang is cited in USA Today (Graham, 2009).[77] By the end of November 2008 the application had been played on more than 1 million iPhones and in summer 2009 it was one of Apple's "All-time top 20 Apps". The company behind the 'Ocarina' is called Sonic Mule, or short Smule and was founded by Ge Wang and Jeff Smith. Wang is Assistant Professor at Stanford University and has previously initiated laptop (Wang, Trueman, Smallwood, & Cook, 2008) and mobile phone orchestras (Wang et al., 2008).

76. Smule also published two 'Ocarina' songbooks, one with "timeless classics in Smule's Holiday 'Ocarina' Songbook" and one called "Folksongs from Around the World" (produced by Smule and Debbie Cavalier, Berklee College of Music (Smule, 2009).

77. All numbers in this section are from mid-October 2009.

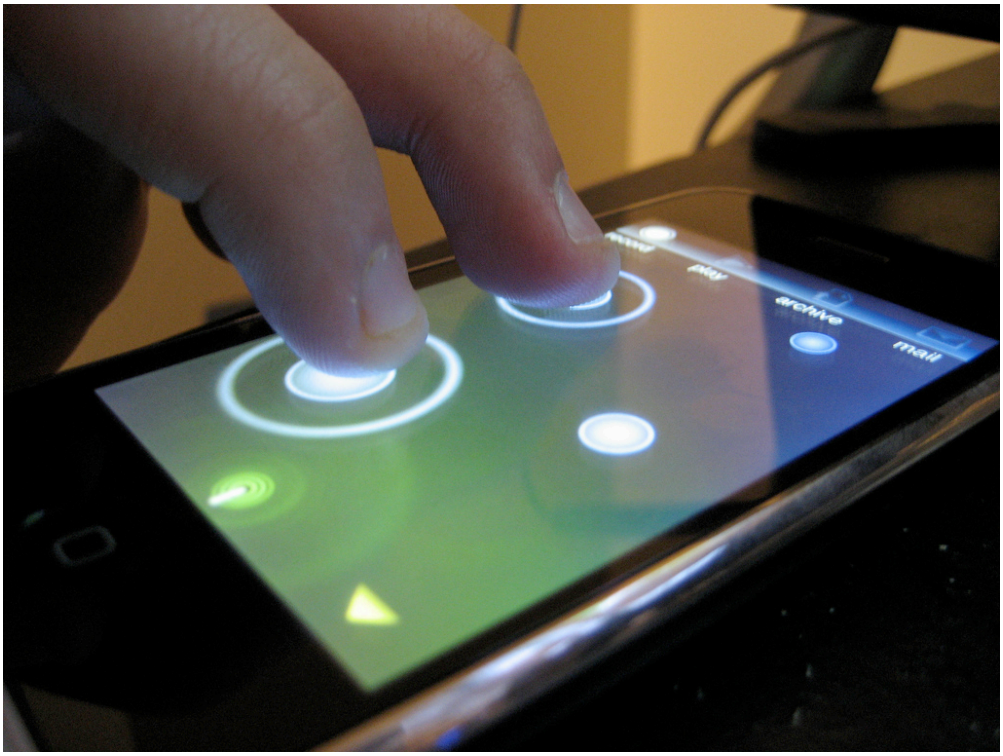


Figure 30: The 'Ocarina' touch screen interface uses finger 'holes' like a recorder or a traditional ocarina

There are not many scholarly publications discussing the 'Ocarina' yet. It is referenced by several other developers of mobile music applications that cite the 'Ocarina' as an example of "breath-controlled wind instrument[s]" on mobile devices (Weinberg, Beck, & Godfrey, 2009), and as example of mobile phone instruments with an academic background (Gillian, O'Modhrain, & Essl, 2009); both from the International Conference on New Interfaces for Musical Expression (NIME), where Ge Wang also presented the 'Ocarina' in 2009 (Wang, 2009), and where mobile music has been presented for several years now, as discussed elsewhere in this thesis (see chapter 'A Taxonomy of Mobile Sound Art', p. 48ff.). The 'Ocarina' is also mentioned in user guide books (such as *iPhone for Dummies* (Baig & LeVitus, 2009, p. 256) that explain the iPhone and recommend specific applications. But mainly, the iPhone 'Ocarina' has been discussed in newspapers, magazines and the online press.

The excitement in the press about the 'Ocarina' becomes apparent in the following comments: "The remarkable 'Ocarina' app [...] transforms this most up-to-date of contraptions into an instrument that dates back 12,000 years by harnessing the iPhone's built-in features in a wonderfully creative way" writes the PC magazine (Muchmore, 2008) and the New York Times notes: "It's one of the most magical programs I've ever seen for the iPhone, and probably for any computer" (Pogue, 2009). The same author adds: "It's a brain-frying experience to know that you're listening to someone else playing 'Ocarina', right now, in real time, somewhere else on the planet. (And then you realise that someone, somewhere might be listening to *you*!)" (Pogue, 2009). These comments illustrate the usual buzz of 'new' technologies that is challenged in this chapter.

It is not only the fact that it turns a mobile phone into a musical instrument that excited the press, but also the fact that this is a commercial success. There are numerous articles discussing the business side of the company behind the 'Ocarina', such as The Guardian: "The iPhone 'Ocarina' is the sound of serious money" (Naughton, 2009) or Newsweek that reports that smule is already profitable at the end of 2008: "Released in November, 'Ocarina' racked up 400,000 downloads in less than a month. Smule, which originally set a goal of taking in $100,000 in revenue this year, instead will end up making closer to $1 million" (Lyons, 2008). USA Today discusses the finances of Smule: "Smith raised $5.5 million from local investors and says his target was to do $100,000 in the first six months. Instead, Smule did $500,000. The sales target for the first year was $1.6 million, and Smith says that will be exceeded, too" (Graham, 2009).

The popularity and dynamics of the app market is often compared to the early days of the dot-com boom (Naughton, 2009). The itunes app store was launched in July 2008 and USA Today reports that "The App Store is doing its part to put upstarts on the map: Smule CEO Jeff Smith says sales of its 99-cent 'Ocarina' synthesiser application have

exceeded half a million in just under a month" (Baig, 2008). For the one year anniversary of the Apple App Store in July 2009, the influential gadget and technology blog TechDigest has voted the 'Ocarina' the number one of "The 101 best iPhone apps in the world today" (Merrett, 2009), and in October 2009 it is still listed as 'top 20 download of all times' in the app store.

The press attributes part of Smule's success to their marketing: "Wang's marketing strategy focused on working the social Web via YouTube, Twitter and Facebook," as Graham observes (Graham, 2009). Wang explains in a newspaper interview with USA today why the YouTube videos are so crucial for their campaign: "If you see some person holding a phone like a sandwich and have sound coming out, you get it" (Graham, 2009). In addition, 'Ocarina' and other smule applications have been featured widely on other US and international media, including TV (e.g. CNBC, Fox News), newspapers such as a front page feature in USA today (Money section), and a plethora of online magazines and blogs. Smule applications such as the 'Ocarina' have also benefited from Apple's attention, as underlined by Apple listing the 'Ocarina' as one of the 20 best apps in April 2009 (The Mule, 2009b) and inviting them to speak at a presentation of the iPhone software update (The Mule, 2009c).

How does the designer of the 'Ocarina' envision it to integrate music making into our every day lives? Graham (2009) cites Wang in USA Today: "we believe that everyone is inherently creative; and we want to unlock that creativity in everyone." And Wang continues in the same interview: "People were learning how to play music for the first time, on an iPhone" and he hopes these applications "can bring the vision of computer music to a much wider audience" (Graham, 2009). And smule's CEO adds in the same USA today article that "Here's an opportunity to combine music with technology, where anybody can play. You don't have to spend 10 hours in a practice room learning

how to play. With the iPhone, anyone can do it" (Graham, 2009). This vision of reaching out to a wider audience, to 'anybody' is of course still talking about a very selected audience in reality. The iPhone is one of the most expensive mobile phone arrangements on the market, and its audience is not 'everyone' but it is the higher socio-economic groups.

While the sales and download figures indicate that people have the 'Ocarina' on their phones, these figures do not tell us if and how people actually play the iPhone 'Ocarina'. But there are other indications of 'Ocarina' use. The fact that thousands of people take time to rate it in the app store, shows that people do actually play it and care enough about it to write a comment.: As of mid-October 2009, the 'Ocarina' had been rated 2783 times in the UK app store. Another indicator are videos that people took of themselves playing the 'Ocarina' and that they have posted on YouTube. As of mid-October 2009, there are 921 videos tagged with 'Ocarina' and iPhone on YouTube. Some of these 'Ocarina' players posting on YouTube have become quite popular online. One examples is @docjazz4 who after videoposts of playing the real 'Ocarina' since 2006, has added postings of playing the iPhone 'Ocarina' with more than 30'000 views (docjazz4, 2009).

The 'Ocarina' has also been featured in several public events and concerts, such as a concert with the 'San Francisco Symphony' (Mule, 2009). Anytime when I started the application on my iPod touch there were other players performing at the same time, so I could listen to them. However, most of these were more akin to practising alone. If you do not like the performance you are listening to, you can skip to the next one. As one Blogger writes "you'll probably be using this button often, as many of the people playing are awful" (Kincaid, 2008).

The 'Ocarina' forum and its many active contributors illustrate how active the player community is. The 'Ocarina' forum (‚Jeremy1026, Docjazz4, PeaceShot, & al., n.d.) is one of several smule forums, where the most popular applications have their own forum. There are six sub-categories with more than 6000 posts combined. The category 'share your score' has by far the largest number or posts (more than 3000), followed by 'General Discussion', "Ocarina' Q&A' and 'Score Requests' with between 600 and 700 posts each. There are 133 posts of "Ocarina' Videos' and 2 in "'Ocarina' Songbooks'. The most 'loved' 'Ocarina' performances are listed on the website as well (Smule, n.d.). On the 13th of October the top performance was "A Whole New World" performed by 'Aladdin' that was loved 196 times, and listened to 1489 times; followed by 'Auld Lang Syne' (by an unnamed performer), loved 184 times, listened to 2105 times. The list goes on until position 25 with an 'Untitled Melody' (by another unnamed performer) that has been loved 101 times and listened to 601 times. This gives us an indication of the number of people who are performing for others and also those listening and voting.

Another indicator for the popularity of playing the 'Ocarina' (and not just downloading it, as the numbers tell us), is the 'Ocarina' contest. This contest opened on 11 December 2009 (The Mule, 2008b) and the first five winners were announced on 14 January 2009; another five winners were announced after the extended deadline on 16 February 2009, making it in effect a second competition (The Mule, 2009a). The competition was initiated by a YouTube video posting that received 69 video responses (The Mule, 2008a), other figures for entries are not published. The 10 winners are featured on the 'Ocarina' website (The Mule, n.d.) and the winning videos received between 6,246 and 277,429 views, with a combined 424,615 views.

It appears that the exposure to the iPhone 'Ocarina' also inspired people to start playing the 'real' 'Ocarina', as people discuss in the smule forum (‚Jeremy1026, Doc-

jazz4, PeaceShot, & al., n.d.) and a comment to an article about the iPhone 'Ocarina' reads "Thanks to Smule the small Real 'Ocarina' community is starting to flourish more and the different styles of 'Ocarina' from all over the world are starting to grow fast!!!" and links to an 'Ocarina' online community (stanton, 2009).[78] Another website dedicated to 'real' 'Ocarina' playing remarks that you have to pay "over £400 for an iPhone and under £10 for a real 'Ocarina' and book," which of course does not take into consideration that people already own the iPhone, they do not buy it specifically to play the 'Ocarina' (Liggins, Liggins, & Ocarina Workshop, n.d.).

One critical question concerns how long and how deep people actually engage with applications like the 'Ocarina'. It might be more of a gimmick for some people, something new to try out. However, the educational potential of mobile phone instruments is big, and I argue that it has only just started. In similar ways to music listening and sharing, now music making, remixing and gaming becomes accessible to people who do not own computers and broadband connections. Turning existing popular media into musical instruments (instead of specialised devices or software) has proven popular with game consoles, guitar hero and other games are examples (Blaine, 2005).

Smule has developed several aspects of the 'Ocarina' further for its next release (15 April 2009) of a musical iPhone application called 'Leaf Trombone World Stage' that is sold as a "Massively-Multiplayer Musical Game" (Smule, n.d.).[79] The website describes it as "an instrument, a game, and a huge global social experience" (Smule, n.d.). You

78. For further discussion of online research see p.131 and chapter 'Mobile And Sonic Methodologies' (p. 81ff.).

79. Smule has released several iPhone apps, including two voice-related apps, 'T-Paine' and 'Sonic Vox'. 'Sonic Vox' changes your voice (recorded or real-time) with various filters such as 'cat', 'cylon', or echo, and you can adjust and change the sound with touch-screen interaction (released 24 October 2008) (The Mule, 2008c). 'T-Paine' (released on 04 September 2009) puts the voice effect of the popular rapper T-Paine onto your voice in real time, another very popular app. 'Sonic Boom' is both visual and sonic, you can customise your explosive on screen and then watch and hear it explode. As other people explode their devices this is visualised and sonified in real time on a global map.

play the instrument by blowing into the microphone of your iPhone and by sliding your fingers on the touch screen. The main focus on the website it on the ease of use. Sharing your music making with others is a key part of the instrument as well. The sharing does not happen with physically present people[80], but over the network: "You can practice your favourite songs as much as you like. Then when you feel ready, strut your stuff by performing on the World Stage, our revolutionary new platform where Leaf Trombone lovers around the world can listen to and score your playing" (Smule, n.d.). Additionally, players are invited to "Compose your own hits for Leaf Trombone with the online Composer and publish them directly to the phone", and of course there is an online community with forums, help, videos etc. (Smule, n.d.).

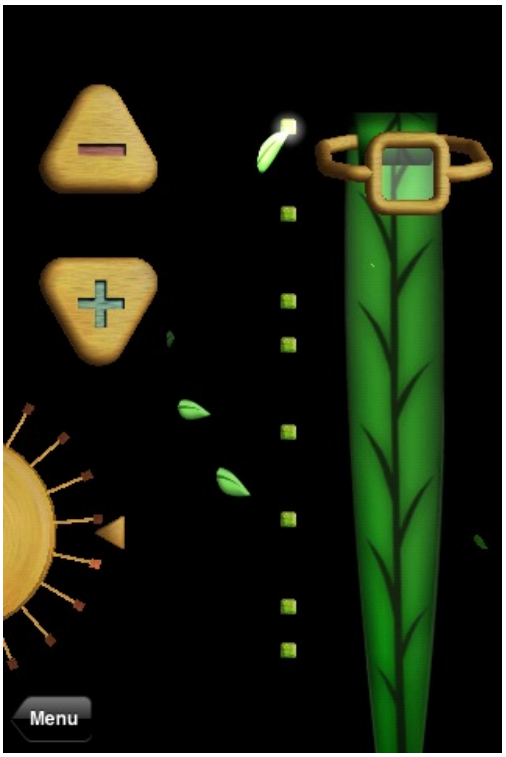


Figure 31: The interface for playing the 'Leaf Trombone' where players slide their index finger along the leaf to change the pitch (the green squares indicate the 'correct' position to hit notes in the chosen scale, the yellow 'wheel' plays an accompanying rhythm)

80. Tough there is a new feature that allows you to play duets with physically present people.

Figure 32: One part of the 'Leaf Trombone' interface allows players to judge other players' performances

Many of the 'Ocarina' features, including the musical instructions as how to play it, were only accessible via the website, not through the application itself. This is different for the 'Leaf Trombone' where most features are part of the application. This makes it easier for new players to learn the instrument. I agree with several articles (Kincaid, 2009; Farshi, 2009) that this makes the 'Leaf Trombone' more accessible than the 'Ocarina'. Amongst plenty of praise that reads similar to the ocarina press coverage, there are also some critical voices. Several reviews comment on the tone quality: "this isn't exactly the most beautiful instrument on the planet: Smule's earlier 'Ocarina' and plenty of other wind instruments might well sound more pleasing" (Horwitz, 2009) and: "not to insult all of the trombonists out there, but the instrument is not especially soothing to the ears. Unlike the 'Ocarina', which is surrounded in mystique and has a tranquil, soothing sound, the trombone is a bit more… abrasive" (Kincaid, 2009). And the com-

petence level of most players is rated as: "amazingly poor performances (...) are plenty to be heard during normal judging" (Horwitz, 2009).

This section of the chapter discussed the iPhone 'Ocarina' (and the 'Leaf Trombone'), a musical instrument on a mobile phone. The social aspects of the iPhone 'Ocarina' are a key aspect of this instrument. The playing, the listening, the judging, and the sharing of related information such as scores - they all happen in networked, social situations. I suggest that the iPhone 'Ocarina' as a phenomena of popular culture builds on the success of musical console games such as guitar hero, and of the proliferation of 'apps' on the iPhone. There are two main differences to the 'Pophorns' that I discussed in the first part of this chapter: the iPhone 'Ocarina' is a phenomenon of popular culture and it uses the entire telephone network (not only the device). Again, one could get excited that it is 'new' to take advantage of the networked capabilities of the mobile phone for turning it into a musical instrument, and this has been the main point of view in the press coverage. In the next section of this chapter I show that using the entire telephone network as a musical instrument is not as 'new' as many might think.

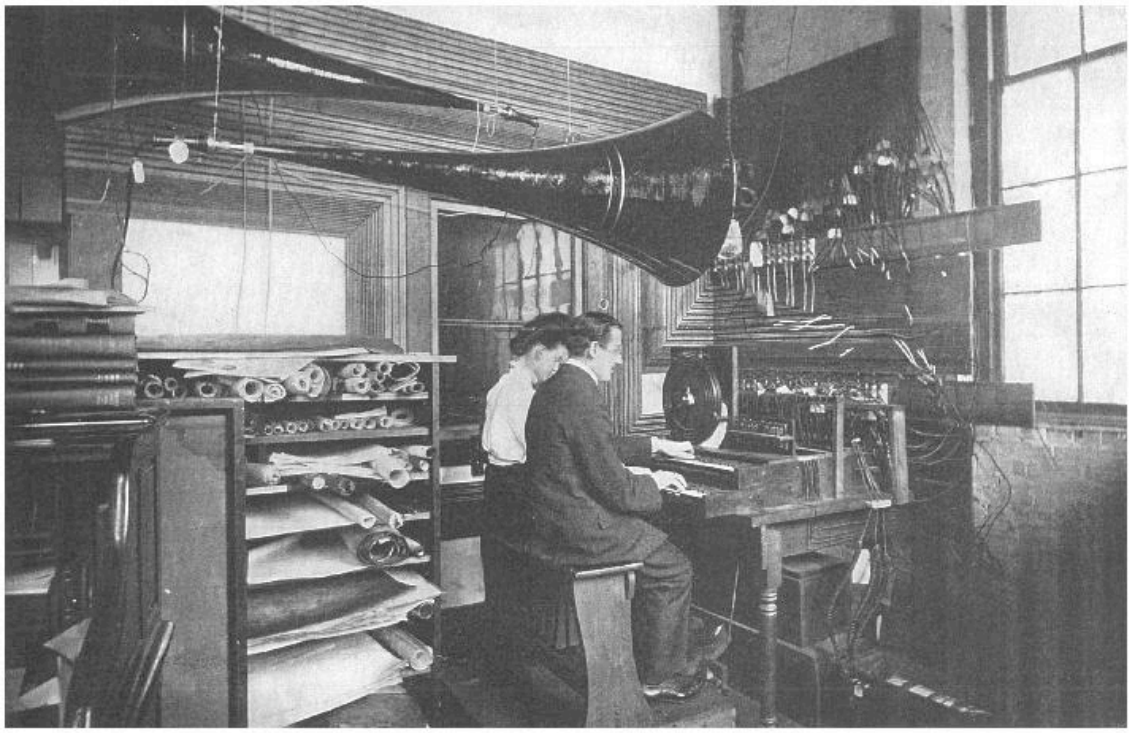
4. The 'Telharmonium': Telephone Instrument a Century ago

Playing music on a telephone and having a remote audience listening to this music in real-time: this is 'brand new' with smart mobile phones such as the iPhone. Or is it? This section of the chapter continues the theme of using the telephone network as musical instrument and focuses on the history of it.

Built about a century ago, the 'Telharmonium' was one of the first electronic instruments and it worked by using the telephone system for amplification and broadcasting. The 'Telharmonium' (sometimes also called 'Dynamophone') is predominantly discussed as part of the history of electronic music (see e.g. Prieberg, 1956; Ruschkowski, 1998; Supper, 1998), and not of telephone history. Weidenaar's (1995) definitive contribution *Magic music from the 'Telharmonium'* is a media archeology that is surprisingly missing from the the usual lists of media archaeologies (see page 120). Weidenaar traces the idea of broadcasting music via telephone back to Bellamy's 1887 novel 'Looking Backwards' (Weidenaar, 1995, p. 11).

In 1864 Thaddeus Cahill worked on the invention of a musical instrument when he realised that he could use telephone receivers "as vibrating body to produce the sound" and in the next step he also realised that "if the output currents could be transmitted by wire to a telephone receiver, they could be transmitted wherever wires might be run" and he hoped to eventually reach thousands of people in many cities (Weidenaar, 1995, p. 15). Thaddeus Cahill invented the 'Telharmonium' in 1900; it was one of the first electronic instruments. As the name already hints at, it worked only in combination with the telephone. The 'Telharmonium' had enormous dimensions and was an immense technical apparatus: it weighed 200 tons and needed up to 35 steam driven power en-

gines producing 10.000 watt of electricity altogether (Weidenaar, 1995, p. 69).[81] Each of these generators produced a sinus wave and each of the 'Telharmonium's' sounds was an addition of sinus waves, controlled by an operating unit that consisted of keyboards and switches.



THE KEYBOARD OF THE INSTRUMENT FOR PRODUCING MUSIC BY ELECTRICITY

Pressure on a key sets in motion the current of a generator of a particular intensity. The vibrations make tones in a telephone receiver at the other end of a wire connecting with the generator. The variations in the intensities of the different generators produce the differences in the tones. The music may be heard with equal volume in the room with the keyboard or at a receiving telephone seventy miles away

Figure 33: The 'Telharmonium' as portrayed in a contemporary newspaper article, with the accompanying explanation

The telephone was needed because in Cahill's days there was no other amplifier available, the electric tube, for example, was invented only 50 years later by Lieben and de Forest. But the telephone's invention was only one of the three technological requirements that allowed Cahill to build the instrument. In 1863 Helmholz had shown that it was possible to sum up sinus waves to create complex sounds. And in 1831 Faraday had

81. The Telharmonium is an anti-thesis of a mobile phone musical instrument in terms of weight and immobility.

invented the electronic generator that allowed producing the alternating currents needed to form these sinus waves.

The 'Telharmonium' used the public telephone network to amplify its sounds to make them audible. The feedback after a demonstration of the first built instrument 1900 in Washington was positive and provided Cahill with investors for building a second, improved 'Telharmonium' (Weidenaar, 1995, p. 35). After a preview in 1906 (Weidenaar, 1995, p. 69), in 1907 is was opened to the public in NYC (Weidenaar, 1995, p. 121) and subsequently cafés and restaurants were amongst the first subscribers (Weidenaar, 1995, p. 125 ff.). The suggested figures for fees (Weidenaar, 1995, p. 38) and numbers of venues (Weidenaar, 1995, p. 75) were as optimistic as much of the press coverage (Weidenaar, 1995, p. 50 ff.). Mostly, popular classical music was played and there were even plans to expand the range of music by introducing four different channels each dedicated to one style of music.

Over time, the technical and legal problems of the system became more and more obvious, leading to a decrease in public interest. The biggest problem was that the transmission of music interfered with the regular use of telephone lines and jammed phone conversations. The companies behind the 'Telharmonium' aimed to install their own cables, but never did this on a larger scale. Despite many contracts with hotels, restaurants and other venues, there was not enough financing to put in all the wires needed for connecting them, as most of the money had gone into the 'Telharmonium' Hall (Weidenaar, 1995, p. 223), and not into infrastructure.

'Telharmonium' Hall was a dedicated venue in New York City,[82] where the instrument was performed to the public during two seasons in 1907 and 1908. The Great Depression hit at the end of 1907, and the 'Telharmonium' Hall in NYC closed after only its second 14-week season in 1908 (Weidenaar, 1995, p. 221). Another aspect not to forget about, is that the sound of the 'Telharmonium' was said to be quite annoying after a while, suggesting that the novelty of listening to the 'Telharmonium' might have worn off rather quickly. Cahill went on to build a third, more powerful 'Telharmonium' with a standard keyboard (the earlier incarnation had custom ones), presented to the public in 1910, but the reports of European Telephone Broadcasting Services, and the development of wireless services meant it was past its time, and the firms behind the 'Telharmonium' went into bankruptcy (Weidenaar, 1995, p. 223ff).

Théberge perceives the idea of amplifying the 'Telharmonium's' sound over telephone wires as "ill-conceived" (Theberge, 1997, pp. 43-44, 64). But he does not take into consideration that at the time of the instrument's invention there simply was no other means of amplification available. Only later, when Théberge explains the rise of the Hammond organ he states that its success had been dependent on the miniaturisation of Cahill's ideas. Hammond was able to built a radically downsized version of Cahill's 200-ton instrument because at his time electronic amplification was available. Therefore I do not classify the 'Telharmonium' as a design error – it was the result of what was technically possible at the inventor's time, and is by most musicologists acknowledged as the first electronic instrument.[83]

---

82. The Telharmonium was mobile in a very different sense, it was packed up at its production plant and brought to New York City on a train; and eventually also made the return journey (Weidenaar, 1995, pp. 82, 229).

83. The Italian composer Busoni (1911, p. 33) was very excited with this invention after seeing the plans for the first time he labelled it as "extraordinary electrical invention."

I go even further and state the opposite of Théberge: The very fact of using the telephone system for amplification and broadcasting of music was a groundbreaking design idea going far beyond many other electronic music inventions. Hammond built an electronic version of what was popular with musicians for a long time already: he built an electrified version of the piano or spinet. Cahill needs to be credited for inventing a radically new type of instrument that used 'scattered broadcasting'. The telephone system was a crucial part of the instrument: Cahill hijacked it for his purposes, to use it as one giant amplifier. The incorporation of the telephone system in his instrument enabled Cahill to set up a subscription service. It is therefore limiting to classify the 'Telharmonium' only as the first electronic instrument. It needs to be analysed from a much broader perspective, as ancestor of radio and even mobile phone services. Ruschkowski (Ruschkowski, 1998) rightly credits Cahill for being one of the pioneers in realising the economic potential of the cable network. He compares this ability with today's Pay-TV and the Internet - and today we can also see this for the mobile phone sector. The 'Telharmonium' showed at a very early stage in the history of the telephone how musical uses of the telephone can capture the public's imagination. Both the 'Ocarina' and the 'Telharmonium' utilise the entire telephone network for performing these instruments, and to allow others to listen to these performances.

5. Conclusion

In developing the theme of the telephone network as musical instrument, the last two sections of this chapter discussed two telephone instruments: the 'Telharmonium' from the first decade of the 20th century, and the iPhone 'Ocarina' from the first decade of the 21st century. Both telephone instruments were described as 'magic' and 'new' by the respective contemporary press. The 'Telharmonium' was dubbed "magic" in the New York Times (Anonymous, 1906) and "music of the future" in a 1907 article (Anonym-

ous, 1907). And the iPhone ocarina was described as "most startlingly original" (Naughton, 2009), and its new incarnation, the 'Leaf Trombone' is described as "one of the most magical programs I've ever seen for the iPhone, and probably for any computer" (Pogue, 2009). This chapter identified these similarities across media histories and discussed these connections by drawing on the concept of media archeology.

The first sections of this chapter focused on using the telephone apparatus as musical instrument and had already uncovered a more general musical legacy of the telephone. Early telephones had been deployed for a range of musical uses. A switchboard operator spontaneously playing guitar to his subscribers, commercial telephone services broadcasting concerts to thousands of customers and the first electronic instrument hijacking the whole telephone system – these and other examples illustrated the fragmented musical history of the telephone. The musical broadcasting has been replaced by radio during the 20th century, a natural development as it seems today. Peters (1999) reminds us that radio and telephone technology both offer the possibility for one to one communication as well as for many-to many communication. Radio broadcasting and party lines on one hand, ham radio and (mobile) phones on the other hand: "The issue is not so much the inherent properties of the medium as the social constellation of speakers and hearers that become enforced as normative" (Peters, 1999, p. 195). Periods far apart in terms of the years lying in between them may be more similar in terms of ideas or feelings than periods close to each other in terms of historic dates (Peters, 1999, p. 3).

In a few years, it may well seem unusual that the telephone was used for nothing else but making phone calls for such a long period of time. This shows how much our perception of history is influenced by our present position. In the (second part of the) 20th century people lived in a world where the telephone was largely invisible, seamlessly integrated into every day life and therefore it was also largely invisible in the his-

tory of technology, its importance long underestimated. If the only thing you have ever experienced the phone used for is making a phone call, you would consider all the different uses that have been deployed earlier in history as curiosities. From the present every day experience of people using the mobile phone for all sorts of different activities, these odd historic examples start to make sense again and they reclaim their place in telephonic history.

The musical uses today and the musical uses back then did not necessarily use what we think of as the main function of the phone, i.e. real-time voice communication between two parties. Back then and now audio functions of the telephone are used to make, amplify or transmit music in a variety of ways. Analysing the 'Pophorns' and the iPhone 'Ocarina' enabled me to explore how a device the majority of us own and carry with us anyway, can be turned into a *Musical Instrument*. Building on the mobile phone's accessibility, ubiquity and familiarity, this chapter also looked at the technological interactions of these mobile phone instruments (such as pressing button, stroking the screen, or tilting the device), how they engaged with its social contexts (playing a piece for friends or a small group performance, for example) and how they took into account their physical environments (such as a public square or the private bedroom) - all contributing to understanding how mobile musical instruments are performed.

V. "Small Texts"?: Text Messages, Art and Public Spheres

Imagine you walk along a street and suddenly you hear a voice that invites you to send a text message to a certain number. You cannot quite make out where the voice comes from, but send a text message anyway. Your message is broadcast loudly into the street once, then becomes interspersed with messages from other people, becomes shorter and quieter, until the voice falls silent. You realise the voice comes from one of the security cameras in the street (figure 34, page 150). This is how you might encounter 'smSage' - a *sound platform* artwork (see p.57ff.) - by Ralph Borland and Tim Redfern that I researched at the 'Conflux' festival in Brooklyn in 2007 and experienced again at the 'ISEA' festival in Dublin in 2009.

Figure 34: 'smSage' by Redfern and Borland, installed at a festival in Brooklyn (NYC) in 2007

One of the feeder concepts for mobile sound art identified in an earlier chapter of this thesis was public art (see p. 29ff.) The tradition of new genre public art often located art in public places in order to intervene in the public sphere, either through dialogue or by making a statement. In this chapter I investigate how mobile sound art might also be thought about within the tradition of public art, either because artists are actively seeking to intervene in it or because an artwork makes a statement in a public space which seems to question certain aspects of what might constitute a public sphere, and who gets to speak in it.

During the course of the 20th century, electronic media (including broadcasting media such as TV and communication media such as the telephone) tended to be situated in private and indoor spaces. Networked media such as the internet that arguably enable people to participate in public debates or contribute to public spheres (Dahlgren, 2005; Roberts, 2009), have also been largely tied to indoor spaces (such as homes, offices or cafes) that were also often private spaces. Mobile media started to reverse this development and allowed people to use (their own) media (devices) in public and outdoor spaces. At present, mobile media are mainly used for forms of private communication and consumption such as phone calls, text messages or iPod listening. This chapter however discusses artworks that experiment with a different use of mobile media; they open up private messages to public broadcasts. Drawing on Augé and Flusser, Föllmer (1999) suggests that public space has lost many of its social and communicative functions to the media over time, but hopes that public sound art can be one contribution to a reviving of public space. This chapter explores the relationship between the act of reviving public space and notions of public spheres.

I approach this through an investigation of how the mobile sound platform 'smSage' engages in 'making' a (transient, micro) public sphere, however I am at least as inter-

ested in the failures of that space as in what succeeded. *Sound Platforms* are designed by artists to invite the audience to contribute sounds that are then placed in the public in specific ways (as part of a GPS sound walk, or broadcast by a speaker, for example).[84] I also briefly introduce two other artworks ('TextFm' and 'Tool for Armchair Activists') that also invite the audience to send text messages that are broadcast publicly. Habermas' public sphere concept and in particular the contention that acts of communication can constitute an artwork (Kester's concept of 'dialogical aesthetic') open up and frame these discussions. In particular Habermas' consideration of the problematic of the public sphere as "small texts" and their interactions are discussed in relation to the practitioner's understanding of their engagement with the public in 'smSage' (Habermas, 1996, p. 374). Habermas' concept of episodic, occasional and abstract publics, as well as the notion of mobilising public spheres and his description of how issues can move from the periphery to the centre of the public further inform the analysis of the artworks in this chapter.

1. Habermas' Public Sphere

Habermas understands the public sphere as "a social phenomenon" (1996, p. 360). Communication is central in establishing the public sphere: "The public sphere can best be described as a network for communicating information and points of view" or as a "social space generated in communicative action" (Habermas, 1996, p. 360).[85] Habermas explains further:

> In complex societies, the public sphere consists of an intermediary structure between the political system, on the one hand, and the private sectors of the

84. For my definition of sound art 'platforms' see chapter 'A Taxonomy of Mobile Sound Art' (p. 48ff.)

85. Parts of this section of this chapter have been published previously as Behrendt, F. (2008). Texting and Calling Public Spheres: Mobile Phones, Sound Art and Habermas. In M. Hartmann, P. Rössler, & J. R. Höflich (Eds.), *After the Mobile Phone? Social Changes and the Development of Mobile Communication* (pp. 35-54). Berlin: Frank & Timme.

> lifeworld and functional systems, on the other. It represents a highly complex network that branches out into a multitude of overlapping international, national, regional, local and subcultural arenas. (Habermas, 1996, p. 373)

Underpinning the public sphere is the "ideal speech situation", a space between two (or more) people who communicate with each other, constituting the speech situation by doing so: "Every encounter in which actors do not just observe each other but take a second-person attitude, reciprocally attributing communicative freedom to each other, unfolds in a linguistically constituted public space" (Habermas, 1996, p. 361). Ideal speech acts have the goal to produce some sort of mutual understanding, not in terms of a binding law, but in terms of trying to persuade the other person with the better argument.

As we can see, for Habermas, communication is central in establishing the public sphere, a "social space generated in communicative action" (1996, p. 360). We can read the act of participating in the art works discussed in this chapter - sending a text message - as a communicative act that generates a social space. The texts messages that establish these works do not stay in the realm of private communication as they would do in everyday mobile phone conversations, instead, they are broadcast into public spaces.

As discussed earlier, in *Conversation Pieces*, Kester (2004) develops a "concept of a dialogical aesthetic" and draws on Habermas to make a link between aesthetics and dialogue (for a more detailed discussion of his concept see p. 40 ff.). In one of Kester's case studies – 'Intervention to Drug-Addicted Women' by WochenKlausur – the artists invited a diverse range of concerned parties to discuss the drug problem in Zurich during several boat trips on the lake Zurich (Kester, 2004, pp. 110-111). The participants were not listening and speaking as people with official roles, but as individuals, and the artists provided the space and time for this. Kester argues that this resembles Habermas' 'ideal speech situation': the artists were "able to create a physical and psychological

'frame' around the boat talks, setting them apart from daily conversation and allowing the participants to view dialogue not as a tool but as a process of self-transformation" (Kester, 2004, p. 111). The project did actually lead to a local solution to the problem.

In the mobile sound art platforms discussed in this chapter, the dialogue is not aimed at resolving a specific social problem, but they are offering a platform for dialogue, they enable private communication (text messages) to become part of a public dialogue (a work of public sound art). In these artworks the frame is the sound, the noise of having these messages broadcast into public spaces. Kester argues that communication art works tend towards establishing their framework by the very process of communicating and this observation is relevant for 'smSage'.[86] The key is that you do not have to 'like' an art work to start engaging, to open up your sense, to enter the process of "self-transformation" - Kester argues that the very process of participating in the communicative encounter triggers the process of critical reflection (Kester, 2004, p. 111).

1.1 Multiple Public Spheres

Habermas' public sphere concept has been critiqued extensively, in particular demands for consideration of multiple and diverse public spheres have been prevalent (e.g. Calhoun, 1992; Fraser, 1992; Silverstone, 1999; Crossley & Roberts, 2004) with Fraser's 1992 account being one of the most prominent ones. Fraser values Habermas' concept as "conceptual resource" but rejects key assumptions of Habermas' concept of the public sphere as inadequate for existing late-capitalist societies (1992, p. 110). One of the main critiques of Fraser and others is Habermas' idea of a singular public sphere.

86. and also 'TextFm' (see p.165ff.) and 'Tool for Armchair Activists'(see p168ff.), as discussed below.

In *Between Facts and Norms* (1996) it becomes clear that Habermas has taken some of this criticism on board.[87] His concept has become more fluid and he seems to embrace the idea of multiple public spheres: he observes a “substantive differentiation of public spheres”, for example (Habermas, 1996, p. 373). Where he talks in the plural he seems to use the terms “publics” and “public spheres” interchangeably, e.g. when he names some publics to illustrate his point about differentiated public spheres: “popular science and literary publics, religious and artistic publics, feminist and ‘alternative’ publics, publics concerned with health-care issues, social welfare, environmental politics” (Habermas, 1996, pp. 373-374). He still talks about a “universal public sphere” referring to it as “the one text”; but he then clarifies that within this overarching public sphere there are numerous “small texts” or “segmented public spheres” (Habermas, 1996, p. 374). He is insistent about the porosity of the boundaries between them; they “remain permeable” and small texts “can always build hermeneutic bridges from one text to the next” (Habermas, 1996, p. 374); this is a main difference to system theory with its auto-poetic systems (Luhmann, 1994). In Habermas’ theory, systems can communicate with each other, they do not develop a language of themselves; systems are not auto-poetic. All the various public spheres operate with “natural language” and thus “remain porous to one another” (Habermas, 1996, p. 374).

That Habermas speaks of micro-public spheres as "small texts" (1996, p. 374) resonates with my study of sms-based art - where the audience sends in 'small texts'. Can these small text messages also be a way to build hermeneutic bridges, to communicate from one public sphere-let to another? Is broadcasting private small texts into public

87. I work with the 1996 translation of Habermas' 1992 *Between Facts and Norms*.

spaces contributing to building the "small text" of a micro public sphere? How can we further describe these small texts, these ephemeral and fragile assemblages?

1.2 Episodic, Occasional and Abstract Publics

Also in *Between Facts and Norms*, Habermas distinguishes three different levels of the public sphere - episodic, occasional and abstract - depending on the "density of communication, organisational complexity, and range" (Habermas, 1996, p. 374). These levels of public spheres range from *episodic* publics found in taverns, coffee houses, or on the streets; through to *occasional*, or 'arranged' publics of particular presentations and events, such as theatre performances, rock concerts, party assemblies, or church congresses; to *abstract* public sphere of isolated readers, listeners, and viewers scattered across large geographic areas, or even around the globe, and brought together only through the mass media (Habermas, 1996, p. 374). Habermas regards the abstract public that is constituted by the mass media as "isolated" and "scattered" and the only connection between them are the mass media (Habermas, 1996, p. 317). It is the location (episodic), the event (occasional) or the media (abstract) respectively that bring the public together in Habermas' model.

In the contemporary environment of pervasive mobile media, are we dealing with episodic, occasional or abstract publics? Mobile media users certainly are often isolated and geographically dispersed, suggesting an abstract public. However, now that mobile media are networked, the listeners, readers and viewers that Habermas describes as "isolated" for the mass media are now also speakers, writers and image generators, for example when making a phone call, sending a tweet or uploading a picture from their mobile phones. These (potentially) collaborative and connecting activities would traditionally have taken place in specific locations or events, pointing to episodic or occasional publics.

In the age of the internet, the locations of episodic publics do not need to be physical locations (such as pubs or coffee houses) they can also be established online, thereby combining features of episodic and abstract publics. At the same time, occasional publics are still (surprisingly) important, audience figures of all sorts of life events have been growing for years, with music festivals being a key example (despite - or maybe because of - the 'digital revolution'). I argue, that it is in the occasional publics that we find the key to understanding how to engage publics in mobile media projects. It is a space where the abstract/episodic publics of mobile media come together in a physical space for a specific reason or event, such as an art festival, a smart mob or a demonstration. Here, they can engage in an embodied, multi-sensory, social way.

With Habermas' concept of episodic, occasional and abstract publics in mind, we can now return to the mobile sound art work 'smSage' in more detail and, explore how the piece opens up private text messaging to the public sphere.

2. 'smSage': A Mobile Sound Platform

'smSage' by Ralph Borland and Tim Redfern was premiered at the Conflux Festival in New York in 2007.[88] 'Conflux'[89] is a festival of contemporary psychogeography where projects investigate "everyday urban life through emerging artistic, technological and social practice" and it aims to "re-imagine the city as a playground, a space for positive change and an opportunity for civic engagement", as festival organiser Ray writes on the website (Ray, 2008). 'smSage' was one of many projects at the festival that were engaging with public space in the streets of the Williamsburg quarter in Brooklyn (NYC). For this case study I draw upon my experience of the piece, my observations, and on the

88. I experienced the piece again in 2009, as discussed below (p.175 ff.).

89. The Conflux festival was founded by Christina Ray and David Mandl in 2003 and is produced by glowlab.

interview I conducted with the artists.[90] This is complemented with material from the project website.[91]

Figure 35: Close-up of the camera housing of 'smSage', Brooklyn (NYC), 2007

The 'smSage' unit (with its speaker and mini-computer) sits in a security camera housing that is attached to a surface in a street as shown in figure 34 (page 150) and figure 35 (page 158). The 'camera' is silent but every few minutes it says "please text to this number". If someone does send a text message to this number, the 'camera' reads out the message at full volume once, then immediately starts breaking the message down, replacing some of the words with ones from previous message, then the number of words is reduced. Redfern and Borland explained that the text messages are read out

90. I attended all days of the festival, Thursday 13th September to Sunday 16th September 2007.

91. The project got some brief press coverage. Most noteworthy is that is was mentioned in a New York Times article about the conflux festival (Schwendener, 2007). 'smSage' was also featured on two more prominent blogs: MAKE magazine blog (Brucker-Cohen, 2007), and the Networked_Music_Review Blog (Green, 2007) as well as on several minor blogs. However, none of these sources contribute further information about the piece.

"loud and then as it starts to disintegrate the message it also starts to diminish in volume and number of words, so eventually it dies out and goes silent" (Redfern & Borland, 2007, p. 27'30).[92] After a few minutes the piece starts to advertise itself again by asking passers-by to text to its number.

'smSage' is self-contained[93] and wireless, consisting of a computer, a mobile phone, an amplifier and a speaker, all squeezed into a security camera housing (as detailed in a diagram by the artists, see figure 36, page 160) - that does not contain an actual camera.[94] The 'computer' carrying out the sms-to-speech processing is an embedded gumstix[95] computer running the open source operating system linux and the incoming messages are stored on a flash memory card. 'smSage' works with an open source speech synthesis system and though this phoneme-based system is more sophisticated than earlier sms-to-speech projects[96] it still features the unavoidable computery voice (Redfern & Borland, 2007, p. 31'53).[97]

'smSage' is also constantly scanning for devices in the vicinity that have their bluetooth status set to 'discoverable' and are thus revealing their 'name'. This bluetooth scanning aims to "use their [the mobile phones] advertised names to try to elucidate a

92. Where the reference of interview material includes a 'p.' followed by a number, this number refers to the time in the recording of the interview (formatting issue with the reference software).

93. Redfern and Borland also aim to make 'smSage' self-sufficient by powering it with a solar panel (at the moment they cannot leave it up as the battery needs recharging).

94. I return to this issue later on in this chapter (see p.157ff.).

95. Gumstix are a popular choice in the mobile developer community and advertised on the company website as: 'the world's smallest full function, open source computers [...] marketed to companies, product designers and hobbyists in more than forty countries worldwide.' (gumstix, n.d.)

96. E.g. 'Simpletext' that was developed by Jonah Brucker-Cohen, Tim Redfern and Duncan Murphy and has been performed since 2003 (Brucker-Cohen, Redfern, & Murphy, 2003). The audience can influence the audiovisual performance with text messages from their mobile phones (and alternatively via internet from their laptops).

97. In the future, the artists might design different voices for it, for example with different personalities, from manic to calm, by adjusting pitch and volume (Redfern & Borland, 2007, p. 31'53).

response, i.e. by saying 'hey there Ralph, why not send me a message on 087 1234567?'," as their website explains (Borland & Redfern, 2007).

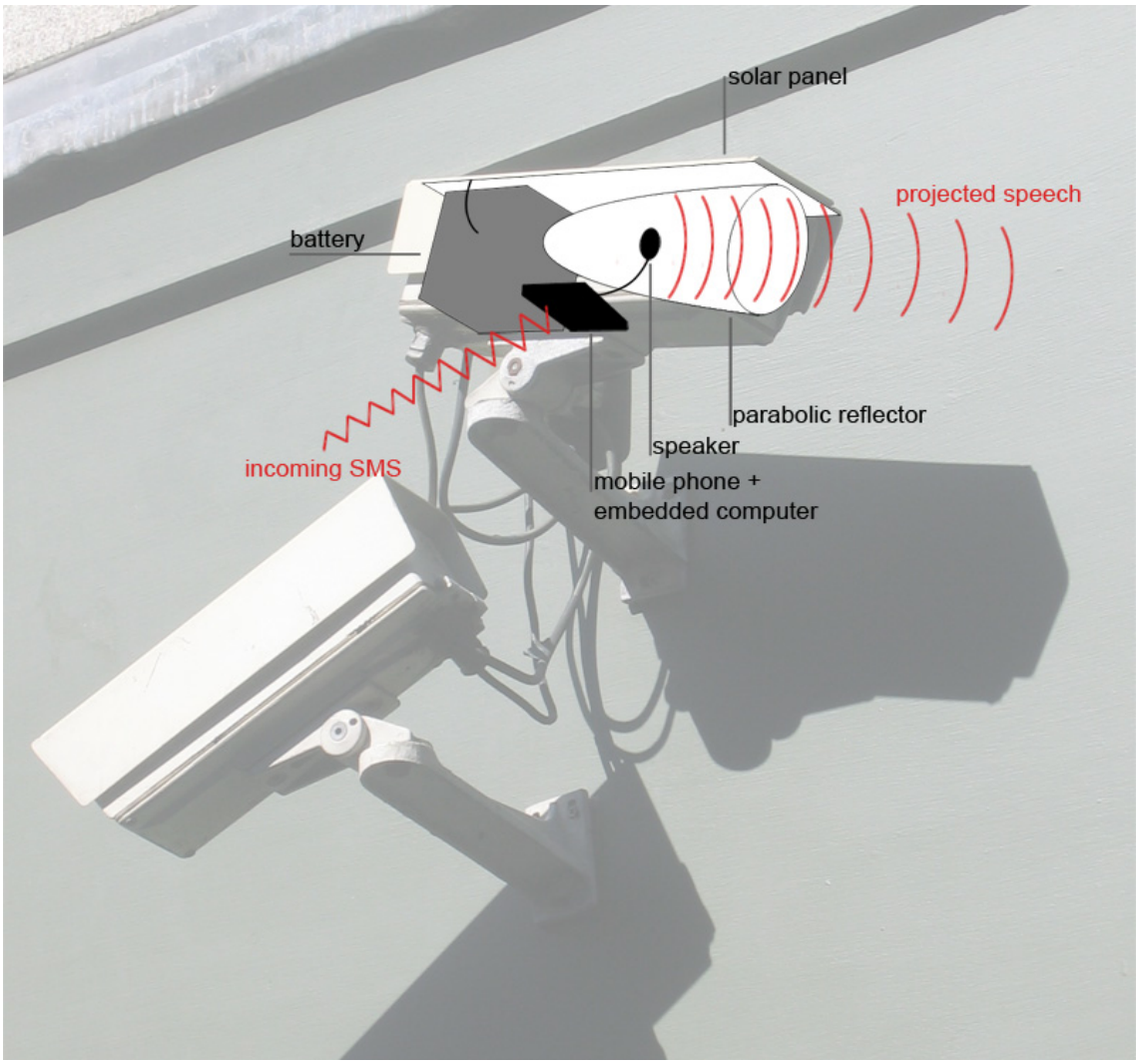


Figure 36: Technical set-up of 'smSage' as illustrated by the artists

The artists conceptualised the project as "disguised and embedded in the city" (Redfern & Borland, 2007, p. 18'28). They imagined "a surreal experience for somebody walking down the street and then hear this voice and they stop and then they are like 'where is the voice coming from, this mad mumbling voice?' And the security camera is the last place you'd expect it to come from" (Redfern & Borland, 2007, p. 18'28).

However, when 'smSage' was set-up during the final day of the 'Conflux' festival, this coincided with a festival 'Block Party' on the street outside the festival venue 'glowlab' with street painters, workshops, puppetry, performances and a DJ playing a large

sound system (see figure 37, page 161). 'smSage' was located close to the block party, and the music was dominating the soundscape. The artists comment that the location of 'smSage' at Conflux was at odds with their aim to have the project "embedded" and passers-by hearing it on their normal walks. The artists acknowledged that one of the aspects of the piece is to work with restricted space, but they had a less 'festival' location in mind. From my own observations I agree that the project works much better in a quiet everyday environment such as a side street. As soon as the quite street chosen as 'smSage' location at the festival turned noisy during the party it was impossible to hear the artwork advertising itself, or the messages sent by the audience.

Figure 37: Part of the crowd attending the 'Block Party' on the final day of the 'Conflux' festival (The sound system and DJ that are dominating the soundscape are not visible in this picture)

When I asked Redfern and Borland about other locations where they would like to put 'smSage' up in the future they name a pedestrianised street in Dublin (where they both live), as this is a location "where there's people passing by and possibly where

there's a social scene, a bar, people hanging out anyway" (Redfern & Borland, 2007, p. 43'30). At the same time the artists are looking for a "quiet place", underlining how difficult it is to find an 'ideal' location for public art and how especially public sound art has very specific needs in terms of location (I return to this discussion below, see p.181 ff.).

One of the main inspirations for the project was "an article that had been in the paper about talking security cameras in England" (Redfern & Borland, 2007, p. 14'51).[98] There cameras enable the officials watching the camera footage in real time to 'talk' to any 'offenders' from their remote viewing location via a speaker that has been connected to the camera. Borland explains that the difference between what they are doing and the speaking cameras in the UK is that the latter are a way for authority to control people, to enforce the rules - whereas their work turns the intended function of a talking camera upside down.[99]

For me, there seems to be an interesting tension between the heavily visual reference of housing the piece in a security camera housing (figure 35, page 158)[100] and the sound focus of the piece - there is no camera but a speaker (and other technology) in the housing. I asked the artists if they had considered that people might interact with the

98. The BBC news article "Talking CCTV scolds offenders' covers this story they mention (BBC News, 2007).

99. Another link between CCTV, sound and art was explored in Track-The-Trackers (2003) by Annika Ruest (Ruest, 2003). While walking through town one hears the presence of surveillance camera on the earphones. Areas densely populated with surveillance cameras produces a dense texture of knocking sounds; each knocking represents one camera and gets louder when approaching it. Participants are invited to add more camera positions to the database using the mobile tracker device they also carry around for listening.

100. The discussion of the camera brings up another interesting topic public art is always facing: how can artists make sure that their piece is not stolen (unless this is part of the piece of course)? Initially, Borland and Redfern were hoping to just leave the 'camera' up, but then it started to become quite precious with all the technology in it. The artists thus need to consider "to carefully place it in terms of it being somewhere where it's out of easy reach" (Redfern & Borland, 2007, p. 44'30). Redfern and Borland know from previous experience with public art that they also need to "look at methods of attachments which are hard to take down (...) and you got to use special lock nuts" - the irony is that not only public sculptures, but also "ordinary security cameras also have to be protected in that way" (Redfern & Borland, 2007, p. 44'30).

camera in a specific way because they might expect that they are filmed while they are texting. They replied that I am not the only one to assume that there is a camera in the housing as well, Conflux organiser Sarah Pace also thought they would "have a record of what happens in front of it" (Redfern & Borland, 2007, p. 46'02). In the interview, the artists briefly consider the idea of including a camera as it would be a way of building in a documentation method but they then agreed that "It is definitely not part of the concept of the piece" (Redfern & Borland, 2007, p. 43'30).

The talking CCTV camera that inspired 'smSage' is a symptom of the CCTV society, of surveillance culture. In 'smSage' this power relationship of being watched and being talked at is turned around. The audience is not watched (although it probably still feels watched because of the visual reference of the camera housing) and the audience itself contributes the messages that are then broadcast, not the disembodied and remote instance of the security firm or state institution that is operating the speaking camera.

The assumptions of what a security camera is - visual surveillance, being watched - are 'broken' in 'smSage' because the visual reference of the camera housing is in fact concealing a sonic broadcast device - a speaker (and not a camera). The artist's use of a surveillance camera housing for their piece is problematic as it raises the question why people should respond to a 'surveillance' voice invitation. The artist's own surveillance position seems to deter people from contributing to the piece, rather than moving them to send in a text message, as I discuss further below.

'Smsage' is quite a transient intervention, due to security and power concerns it can only stay up for limited amounts of time. Also, the auditory communication of broadcasting 'small texts' into public space is of an ephemeral, transient nature. This temporal scale of the piece seems to recapitulate what is found inside it. In the set-up of the piece the ephemeral nature of sound seems to be amplified as each message is only broadcast

once in its entirety, and then fades and gets mixed with other messages. It would have been possible to program the platform in a different way, for example where messages are repeated. The materiality of the private texts messages changes as they are transformed into voice messages, they are given a voice in public, but it is an ephemeral voice.

The public constituting the piece by sending messages is linked to the location of the installation. Does it mean the platform operates like a traditional location of *episodic* publics?[101] Whereas the episodic publics of taverns of coffee houses would rely on 'real' voices of people communicating with each other in an indoor location, in 'smSage' a computer voice is reading out people's written text messages. Traditional episodic publics would come together again and again over time, people returning to the same pub or cafe. Some art platforms might function in a similar way[102] (but often over shorter periods of time such as weeks or months),[103] but 'smSage' is only installed for a limited amount of time, making it more like an event.

Is the public made by 'Smsage' thus more *occasional*? Habermas names performances, concerts and part congresses as examples of public forming around an event. These more traditional occasional publics have a defined location and time frame. 'smSage' however has a more open time-frame than a concert or congress, participants can send their messages anytime (while the installation is up), but in terms of location it operates in a similar fashion to occasional publics: you have to be in the location to participate and experience it. The occasion for 'smSage' is an art festival, and I will return to the significance of this later (p.175ff.).

---

101. As discussed above, see section 'Episodic, Occasional and Abstract Publics' (p. 156ff.).
102. For example 'Park Fiction' in Hamburg (See Wieczorek, 2006; Schmidt-Wulfen, 2004).
103. Hirschhorn's 'Bataille Monument' (2002) for example (see Basualdo & Laddaga, 2004).

The participation in the public sphere of 'smSage' does not only require bodily presence in the location of the installation, it also requires the mediated communication of sending a text message. This would be more indicative of Habermas' *abstract* public, of scattered media consumers. Here, the media are both produced and consumed at once, sending sms and listening to them. The participants are not scattered around the globe, as in Habermas' concept of abstract media publics, they need to be in the very location of the installation.

However, the participants are still scattered (not in space but) in time, a temporal scattering that is amplified by the transient nature of sound. The micro public that is established by the 'small texts' sent in by the audience and broadcast by the installation has aspects of episodic, occasional and abstract publics. The piece's engagement with the public can also be described as ephemeral, transient and fragile, resonating with the artist's own description of 'smSage' as "voicing and remixing participants comments and observations in a transient, ephemeral way" (Borland & Redfern, 2007).

3. Mobilising Public Spheres

Mobile sound art platforms like 'smSage' aim to give a 'voice' to passers-by in public spaces, to "transmit the voice of the public" (Borland & Redfern, 2007), by amplifying their private text messages with a speaker. Could platforms, artworks like these be a way to mobilise dormant public spheres? In returning to Habermas' public sphere concept, I discuss the mobilisation of dormant public spheres and the ability of topics to move from the periphery of the public sphere to the core and illustrate these by introducing two more artworks, before returning to 'smSage' in the final part of this chapter.

Habermas introduces the idea of two different states of the public sphere, a dormant one and a mobilised one. In a “public sphere at rest” the influence of the civil society on the

political system is rather small, but “in periods of mobilisation, the structures that actually support the authority of a critically engaged public begin to vibrate” (Habermas, 1996, p. 379). A mobilisation of the dormant public sphere takes place in a “perceived crisis situation“ (Habermas, 1996, p. 380). According to Habermas,

> the actors in civil society thus far neglected in our scenario can assume a surprisingly active and momentous role. In spite of a lesser organisational complexity and a weaker capacity for action, and despite the structural disadvantages, mentioned earlier, at the critical moments of an accelerated history, these actors get the chance to reverse the normal circuits of communication in the political system's mode of problem solving. (Habermas, 1996, p. 380-1)

One of the first prominent examples for mobile media being used to mobilise a public was the use of text messages (SMS) to summon people for demonstrations in the Philippines in 2001 (Rheingold, 2003, p. 157). Gordon (2007) also discusses interesting case studies of mobile phones being used in moments of Crisis (e.g. SARS, London bombings). Mobile technology can facilitate two forms of mobilisation. As in the Philippines example, they can be used to gather people for ‘traditional’ forms of protest such as demonstrations. But devices such as mobile phones can also be used for remote forms of activism, where the mobilisation does not result in a physical gathering. The art work 'smSage' illustrates this potential and if we imagine that this platform could be 'taken over' by a specific local or political group, this potential would become even more apparent. Another mobile sound art platform , the ‘Tool for Armchair Activists’, illustrates this.

The ‘Tool for Armchair Activists’ is another example of a mobile sound art platform where the audience is invited to send text messages that are then broadcast publicly. The piece was designed by the interdisciplinary art group ‘Troika’ (Sebastien Noel, Conny Freyer and Eva Rucki) in collaboration with Moritz Waldemeyer in 2005. As can be seen in figure 38 (page 167), it is a self-contained unit meant to be strapped to

a lamppost “in front of pro-eminent [sic] buildings like the house of parliament, or other institutional buildings in front of which many protests occur” (Troika, 2005). Participants can send text messages to an advertised phone number. The unit receives the messages, reads them with a computer voice and plays them loudly via a bullhorn.

Figure 38: ‘Tool for Armchair Activists’ by Troika 2005

Troika advertise as one of the main features of the tool that the activists can stay warm in their comfortable living rooms instead of the “hassle of sitting in the rain, waiting for your favourite MP to pass by” (Troika, 2005). One of the main differences to the other artworks discussed in this chapter is the attitude of the artists: Troika regards the work as ironic (Baker, 2006), labels protests as “rants” (Troika, 2005) and thus the group was amused when the work was featured on an activists' blog (Debatty, 2006). Troika seems to be cynical both about traditional forms of protest ("rant’") and about the remote kind of protest that their work comments upon ("armchair"). Consequently, they do not see themselves in the tradition of ‘remote activism’ with its culture of online

campaigning and hacktivism that has invented numerous new ways for remote (electronic) intervention.

My discussion of 'Tool for Armchair Activists' is based on documentation by the artists, and on reviews of the piece. From the material at hand I cannot comment on the actual use of this platform (as I do for 'smSage'). With its contradiction of enabling remote protests while having a cynical view of it, ‘Tool for Armchair Activists’ still shows the potential of (mobile sound art) platforms to mobilise dormant public spheres by enabling the public to send private forms of communication such as text messages to a public address system that broadcasts these messages into the public.

4. Moving from Periphery to Centre

Habermas also gives a detailed account of how issues can move from the periphery of the public sphere to the core in three different ways. To answer “the central question of who can place issues on the agenda and determine what direction the lines of communication take”, Habermas modifies a model by Cobb, Ross and Ross (Habermas, 1996, p. 379). Cobb et. al. have three different models for how new topics can be pushed from first initiatives to decision-making bodies: “inside access model, mobilisation model, outside initiative model”, depending on who is raising the issue and how it is moved to the decision making bodies (Habermas, 1996, p. 379).

If the initiative comes from inside the political system, and stays inside it without any influence or inclusion of the public sphere, they talk about the inside access model. If the “proponents of the issue must mobilise the public sphere” to successfully pursue an initiative that originated inside the political system, it is the “mobilisation model” as Habermas summarises (Habermas, 1996, p. 379). These first two models are the most common ones because the power of agenda setting is with the Government leaders

rather than with the “parliamentary complex” (Habermas, 1996, p. 380), at least in times of relative political stability.

For this thesis most relevant is the third model - the “outside initiative model” - where the forces of the initiative are located “at the periphery, outside the purview of the political system” (Habermas, 1996, p. 380). For Habermas, the mass media mainly draws on sources by professionals that originate in the centre. Therefore it is much more difficult to “start and manage” issues from the periphery, but Habermas gives a long list of successful examples that made this move, from environmental to Third World issues (1996, p. 380). Habermas credits initiatives on the periphery - from “associations (...) and cultural establishments (...) to ‘public-interest-groups’ (...) and churches or charitable organisations” - as examples for the “informal, highly differentiated and cross-linked channels of communication” that operate at the periphery of the public sphere (1996, pp. 355-356).

Along this process of moving from the periphery to the core, the issues need to be taken up by institutions such as “newspapers and interested associations, clubs, professional organisations, academies and universities” (Habermas, 1996, p. 381). Here, the mass media have a crucial role; they are the main means of moving issues from the periphery onto the public agenda: “Only through their controversial presentation in the media do such topics reach the larger public and subsequently gain a place on the 'public agenda'" (Habermas, 1996, p. 381). Habermas describes various activities that can boost this process, such as “sensational actions, mass protests and incessant campaigning” (1996, p. 381). I argue that art can also be part of this process of moving issues from the periphery to the centre.

For Habermas, art is part of the "'literary' public sphere". He argues that art can be a way to connect personal life experience and public spheres with its own 'language':

> Besides religion, *art*, and literature, only the spheres of 'private' life have an existential language at their disposal, in which socially generated problems can be assessed in terms of one's own life history. Problems voiced in the public sphere first become visible when they are mirrored in *personal life experience*. To the extent that these experiences *find their concise expression in the language of* religion, *art*, and literature, the 'literary' public sphere in the broader sense, which is specialised for the articulation of values and world disclosure, is intertwined with the political public sphere. (Habermas, 1996, p. 365) [my emphasis]

Habermas thus makes an interesting link between art and the political public sphere in describing art, literature and religion as "specialised for the articulation of values and world disclosure" (1996, p. 365). If art has the capacity to find a language to voice personal life experience, this is potentially quite a powerful position. Art can produce condensed versions of personal life experiences and then bring them out into the public sphere. If these experiences are problems that are situated at the periphery of the public sphere, art might take up a similar function as media in moving issues from the periphery to the core of the public sphere. For the examples discussed in this chapter, this function is not only centred around the content of the messages sent in by the participants, it also functions through the very process of communication itself.

To illustrate my argument that (mobile sound) art projects can be one of these activities that can help agenda-setting from the periphery, I introduce another example of a mobile sound art platform where the public sends in text messages from their mobile phones that are subsequently broadcast publicly. 'TextFm'[104] is an interactive installation by the British artists Matthew Fuller and Graham Harwood where text messages are

104. The spelling of this work both by the artists and by the press is inconsistent, including 'Text FM', 'Text.fm' and 'Text-FM'. Here, I use only one spelling: 'TextFm', unless using quotes that include a different spelling.

transformed into a sound collage that is broadcast on radio or via a sound system.[105] Participants are invited to send messages to a phone number that has been published in advance. In addition to the content of the message, people can add parameters concerning the style of the computer voice by adding specific code: the language (e.g. English or German) as well as pitch and speed of the voice (both on a scale form 0 to 9). The text messages are then read out by speech synthesis software according to these parameters and finally broadcast on a local radio station. The work is constantly changing, depending on how many people participate at any given moment. When many people take part, the incoming text messages weave a seamless carpet of words, whereas during quieter periods only the a continuous background sound, (a mix of unprocessed bird song)[106] with the occasional messages in between were broadcast on radio or "by anything with a sufficient sound output, such as a public address system" (Fuller & Harwood, 2004, p. 238).

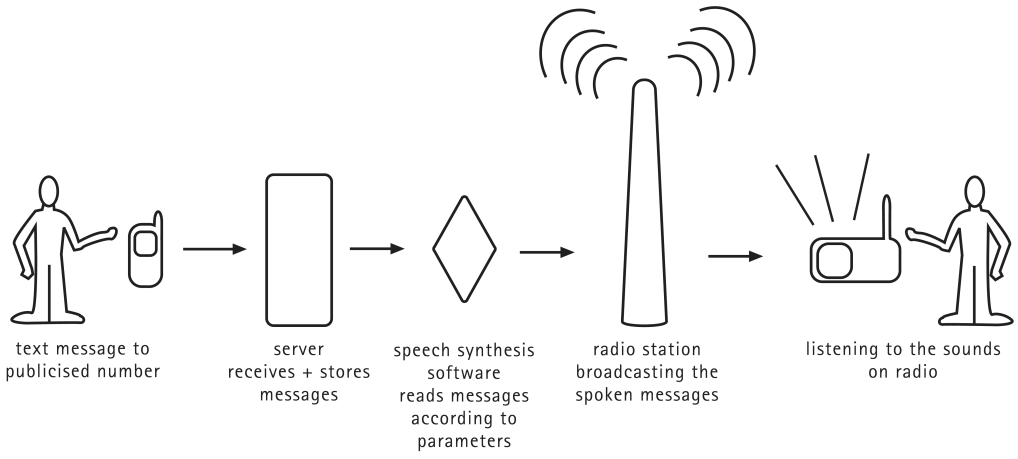


Figure 39: The technical set-up of 'TextFm' by Fuller and Harwood (my illustration). Here, only the radio output is illustrated, but in some instances of the piece, the messages have also been broadcast via sound systems

105. 'TextFm' has been shown several times in 2001 and 2002.

106. The artists used this 'background sound' in order to signal to the audience that the 'system' is still working even if no messages are currently being received and broadcast (Fuller & Harwood, 2004, p. 240).

In summer 2002 ‘TextFm’ was installed in collaboration with 'Public Netbase' to support a campaign for the re-location of this local alternative media institution. 'Public Netbase' put up a ‘Basecamp’, an orange tent in the streets of Vienna’s museums quarter, which was open to the public (see figure 40, page 173). "With the tent's new site, Public Netbase calls attention to the many preconditions for its relocation into the Museumsquarter [sic] that have yet to be realised", as the institution's website claims (Netbase, 2002). The 'Public Netbase' website adds that the orange tent is a '"blazing' symbol for a critical cultural practice, i.e. a monolithic landmark for the much desired cultural diversity that is regularly and ineffectively conjured up in the context of the Museumsquarter" and in addition that 'Textfm' turns it into "a 'sonar' media installation" where "passers-by and remote users can listen to and interact with Text-FM" (Netbase, 2002).

In an interview Fuller describes that during the three-month installation in the tent in Vienna, "the use got really out of control, turning into a social process itself" (Dauerer, 2002).[107] In a later article, Fuller states that 'Public Netbase' supported 'Textfm' and also "took it and turned it into something with their own flavour and daring, connecting the system up to, at different times, a public address system; CB radio, with sets installed in bars and cafes; community radio" (Fuller, 2009). The way 'Public Netbase' used 'Textfm' in their campaign echoes Habermas' concept of moving issues from the periphery to the centre of public spheres.

107.My translation of a German newspaper article. The original reads: "Wir haben es seit drei Monaten in einem Zelt in Wien installiert. Es ist interessant, wie der Gebrauch dabei völlig außer Kontrolle geriet und selbst zu einem sozialen Prozess geworden ist. " (Dauerer, 2002).

Figure 40: 'TextFm' as a public installation in Vienna in 2002. The sound is broadcast via a PA system (and via Internet)

As we can see from these descriptions, at this particular TextFm installation, the sound was not broadcast on radio, instead, a PA was used for audio output. In addition, people could listen to the audio stream on the internet (and also send messages via a web interface). The internet access was the idea of the host institution that aimed to promote Vienna's media culture and to locate it in a global context. The artists remained sceptical about the internet option: "This initiative effectively de-localised the installation" that was originally meant to "find out whether a rich interactive culture of use could - following the London pirate radio scene - be developed in an urban area restricted by the broadcast range of a radio transmitter, or other means of broadcast using the materials of 'TextFm' (Fuller & Harwood, 2004).

The artists' log of the text messages sent in to various 'TextFm' installations shows that the participants invented all sorts of uses for the platform: Some people used the system for "sloganising, conversations, insults, meeting arrangements, flyering for DJ sets, asking questions, setting up conversations", as the artists discuss in an interview

(Kasprzak, 2002). A very different use was more “reminiscent of concrete or sound poetry. Such users would send repeated clusters of characters. For instance a message might comprise of: ‘ugh a ugh a ugh a ugh a ugh a ugh a ugh a...’ et cetera” (Fuller & Harwood, 2004).

Fuller and Harwood's key interest was "creating an open media system" that addresses issues such as censorship, legal issues and technological limitations (e.g. length of a text message) (Fuller & Harwood, 2004, p. 241). The artists understand ‘TextFm’ as an open system that illustrates their sense of the term “Media Ecology”.[108] The work also illustrates Fuller’s concept of “speculative software [that] can be understood as opening up a space for the re-invention of software by its own means” (Fuller, 2003, p. 30). Harwood and Fuller’s 'TextFm' platform opened up a dynamic space that is played by the participants and their mobile devices. Inspired by "Bertholt Brecht's vision of radio as a two-way device" amongst others, their aim was to "open up a novel space for communication" and allow the mobile phone to "tak[e] voice in the city" (Fuller & Harwood, 2004, pp. 240-241). I argue that in allowing private text messages to enter public space loudly, pieces like 'TextFm' can take part in mobilising public spheres, in moving issues from the periphery to the centre of the public spheres.

To go beyond the discussions of concepts of mobile sound art platforms, it is now time to return to the experience of 'smSage'- and to discuss the pragmatics of it, the 'making' of the piece by the audience rather than the 'making' of it in the concept of the artists. After relating specific aspects of Habermas' public sphere concept - the mobilising of dormant public spheres and the moving of issues from the periphery to the

108.Fuller’s understanding of “Media Ecology” - a term originally coined by McLuhan (2008, p. 271) in the 1970s - is that “all media be taken as mutational fields and aggregations of force, subject to change by multiple dynamics, conjunction with new devices, techniques and usages” (Fuller & Harwood, 2004; see also Fuller, 2005).

centre of public spheres - to the mobile sound art works 'TextFM' and 'Tool for Armchair Activists' it is time to revisit the key example of this chapter: 'smSage'.

5. Making and Breaking 'smSage'

In this section I return to discussing the art work 'smSage' and shift my focus from the aims and concepts of the artists to the actual experience of the piece at the 'Conflux' festival. Borland and Redfern's 'platform' aims to "transmit the voice of the public" (Borland & Redfern, 2007). The actual experience of 'smSage' challenges some of the artist's concepts[109] and it is this 'breaking down' of several aspects of the art work, for example the 'breaking' of the communication required to 'make' the piece that holds an interesting tension. The *making* and the *breaking* of the alternative, transient public spheres of the mobile sound art works discussed in this chapter are intrinsically linked. If 'small texts' establish the piece, what happens if they are not being sent or if they cannot be heard?

Urban sociologist Sassen argues that art and activism are ways of 'making public' that are outside the corporate world (Sassen, 2006, p. 20). She distinguishes between "public access space" on one hand and "public space" on the other hand - "the latter requires *making*" [my emphasis] (Sassen, 2006, p. 21). She links her discussion of the relation between globalisation and locality, the complex interstices of various networks and localities, to art and activist projects such as 'Digital City Amsterdam' or 'Mongrel'. Sassen suggests that new media artist allows for:

> the possibility of constructing forms of globality that are neither part of global corporate media or consumer firms, nor part of elite universalisms or 'high culture'. It is the possibility of giving presence to multiple local actors, projects and imaginaries in ways that may constitute alternative and counter-globalities. (Sassen, 2006, p. 25)

109. for this discussion see p. 157ff.

Sassen reminds us that the alternative spaces or (globalities) that these media art projects suggest require *making*. The projects she mentions - as well as the projects discussed in this chapter - are making a public space capable of supporting communicative action. But I argue that the making of these spaces is at least as interesting as the breaking of these spaces. For 'smSage' it seems to be impossible to make this alternative public sphere, this counter globality, without breaking it at the same time. I am not attacking the artists for the fact it breaks, I am discussing how difficult it is to make these spaces. I am investigating their project not through its formal architectures only but through how it worked in practice - when it always broke.

5.1 Texting Impossible

For the first two days of the 'Conflux' festival in 2007 'smSage' was not installed yet, and the artists nowhere to be seen - they were working around the clock to get the piece up and running. The main technical problem was related to the difference between European and US mobile phones networks. For the remaining two days of the festival 'smSage' was up, but was not working as intended: it was still not possible to text in - the camera was broadcasting messages that had been pre-recorded by the artists. This gap between the concept of the piece and the actual experience at the festival was caused by technical problems. The supposedly global communication technology of mobile phones turns out to be not that easily adaptable to different countries. This caused huge problems when the piece came to be set up in a specific location. The artist's frustration with this unravels the promise of easy global communication.

One of the main challenges in developing the piece was the interaction between mobile phone and computer. The artists developed the piece in Europe (Ireland), with a European mobile phone and network. On arrival for the festival in the US, Borland and Redfern realised that although the mobile phone was supposed to work on the US net-

work as well, it did not: "We brought a number of phones (...) with us and as we arrived on Monday we put a SIM card in and expected it to work - and it didn't connect" (Redfern & Borland, 2007, p. 31'12). They tried to solve this by "order[ing] the exact same model of phone but one that is made for an American band" (Redfern & Borland, 2007, p. 31'12). But even with this American phone the communication between phone and "computer seems to be a bit tricky. We're so nearly there. We did get it running. And then it crashed. It keeps crashing" (Redfern & Borland, 2007, p. 31'12). The artist's frustration with the technology (that is meant to be global, to not care where it is) 'breaking down' is understandable, because this means that the audience was not able to send in their text messages to 'make' the piece.

In the interview, the artists also discuss the relation between the technical difficulties, and the economic background of the piece: "we are just a small partnership of artists rather than a huge engineering firm who can get people to solve these things on an engineering level" (Redfern & Borland, 2007, p. 31'53). Redfern and Borland work with a tiny budget and did not receive any funding from the festival or other sources to develop the piece. They applied for arts council funding in Ireland to cover the travel costs but are not sure if they will receive it. Their department at the University of Dublin is paying for some of the hardware and they hope to receive some funding for future exhibitions of 'smSage'.

At the 'Conflux' festival the piece was technically not working and the audience could not send in their text messages that were supposed to constitute the piece, by "transmit[ing] the voice of the public" (Borland & Redfern, 2007). The 'making' of public spheres that 'smSage' was aiming to enable was 'broken' on the level of the technology that was meant to facilitate this communication.

5.2 No Messages

Even when 'smSage' is working technically, there is room for 'break down'. The piece (as most interactive/interventionist media art) is asking quite a lot of its users, expecting them to walk around the neighbourhood, to stop and listen to the installation, to get their phones out and send a text message to the advertised number. The 'breaking' of the piece discussed in this section concerns the possibility of non-participation in the piece.

When I encountered 'smSage' again, at the ISEA 2009[110] in Dublin (Ireland), the piece was working, as the artists assured me. (For unknown reasons I was however unable to send a text message from my specific English mobile phone.) This Dublin set-up is shown in figure 41 (page 179) and figure 42 (page 179). I observed the 'smSage' installation outside one of the festival exhibition openings for about an hour.[111] In figure 41 (page 179) we can see festival visitors standing in front of the windows of a gallery with 'smSage' positioned above their heads. During this time, several members of the festival audience sent in text messages that were broadcast into the Dublin street. These were members of the festival audience who knew about the piece from the conference material and the exhibition the piece was a part of.

110.ISEA is the International Society for Electronic Arts that holds biannual (now annual) conferences and exhibitions at host institutions.

111.Due to my own speaking engagements at the conference I was unable to spend more time with the piece. It was only installed during the afternoon and evening of this specific day of the conference (31 August 2009).

Figure 41: 'smSage' at the 2009 ISEA festival in Dublin: A member of the festival audience texting to the installation ('camera' at top of the photo)

Figure 42: During my short period of observation after the festival audience had moved on from the exhibition opening, I did not see any passers-by interacting with 'smSage' (on the facade on the left) at the ISEA 2009 in Dublin

After a while, the festival audience that was attending the exhibition opening moved on to the next event. I stayed on for a little while, keen to observe passers-by stopping to interact with 'smSage'. During this - very limited - observation period, I did not see anybody that stopped to listen to the installation or to send in their own messages (see figure 42, page 179). If the making of mobile sound art platforms relies on the participation of the audience, on the sending in of text messages for example, to establish the piece (in action, not as concept), then non-participation is also a way to 'break' the piece, in the same way that participation 'makes' it. This observation is not meant as criticising the piece, it is an observation that is also true for many other pieces of interactive and public art, but that is not often discussed. 'Smsage' attracted some members of the festival public to 'make' the piece (in Dublin), but not the general public.

To grapple with this question on what kind of audience 'smSage' is speaking to (or not), what kind of public is 'making' the piece (or not) I return to my earlier discussion of Habermas' model of episodic, occasional and abstract public in the age of pervasive mobile media. 'smSage' aims to speak to an episodic public that frequents the streets of a specific neighbourhood, but also engages with the occasional public of the audience of the art festival it is part of. The interaction with the piece is via mobile media, pointing to an abstract public of media users. Like many other mobile media projects the intended audience seems to be very broad: anyone who happens to walk past regularly (episodic) plus the festival audience (occasional) plus remote media audiences (abstract) - without taking into consideration the specifics of the particular mobile media public. For platforms of mobile (sound) art the occasion needs to be 'made' by the artists, not only by the media (setting up the kit to broadcast text messages) but also by an engagement with the physical and social context of the 'occasion' and its location.

A critical engagement with the actually physical location and its social context, the people who inhabit and frequent and 'make' the space is crucial. Engagement with the way mobile media already operate in these spaces is necessary to find a fruitful dialogue between the physical, the social and the media context in establishing publics. This is difficult - but the 'anytime anywhere' promise of mobile media does not work. 'Platforms' ask people to be engaged, to interact, to contribute, to 'make' the piece. The audience does need to have the interest to engage, and this needs to be realised in platform pieces of mobile sound art.

The artists seem to presume that 'people' (the public) would want to 'contribute' to 'smSage'. Working with an invitation to contribute spoken by an unknown computer voice ("please text to...") and broadcast by a surveillance technology (CCTV camera) in a fairly random location, does not take into consideration the context of the specific public in the location of the installation. This explains partly why the public choose not to respond or did not see this as speaking into the public.

5.3 Cannot Hear

Another 'make or break' moment in mobile sound art is the sound itself. If the actual installation blends in visually (CCTV cameras are ubiquitous in many Western cities, and especially Irish and English ones), and the sound of it is not heard (because of a noisy urban environment), then participation becomes difficult because the piece is in effect invisible and inaudible.

In Dublin, because of the traffic and the many conversations going on amongst the festival audience it was difficult to understand the 'smSage' messages being broadcast. And if we think back to the 'Conflux' set-up of 'smSage' (see p.161), there the sound of the installation was overpowered by the sound of the block party that was going on at the same time (figure 37, page 161). It is almost an irony that a piece of public sound art

that intends to generate a public sphere is being so easily displaced by a more traditional kind of sonic public space activity – the block party. For ‘smSage’ to be able to ‘give a voice’, everybody has to be silent first. The technological set-up implicitly makes these impossibly disciplinarian demands on its potential audience and thus fails to live up to its artists’ intentions.

The examples discussed in this chapter have illustrated that artistic interventions in public do not need to be “eye-opening”, they can also be ear-opening. Sound art challenges dominant textual cultures and visual paradigms of art. The artworks discussed in this chapter are the only (case study) examples in this thesis that are using speakers, public address systems or bullhorns to broadcast sound into public spaces (the examples in the other case-study chapters rely on headphones, or mobile phone speakers).[112] The sonic politics of public sound art, the way it engages with the local soundscape is also crucial in establishing the piece. While loud sound art can be imposing, quiet sound art can be missed (as discussed in the section 'Sound Art' (p. 29ff.) in an earlier chapter), rendering the piece 'invisible'.

112. But there are other speaker-based examples mentioned in the chapter 'A Taxonomy of Mobile Sound Art' (p. 48ff.).

6. Conclusion

Drawing on Habermas' concept of (multiple) public spheres, I argued that the kinds of public spheres that mobile media establish are a curious mix of episodic, occasional and abstract (Habermas, 1996:374). Abstract and scattered media publics can be brought together as occasional publics at certain events (such as participating in an artwork) that are rather episodic (e.g. on a street corner). These micro-publics are established through small texts in a temporary intervention or platform, making them ephemeral (sound) and transient (you walk past). The notion of mobilising dormant public spheres that begin to "vibrate" (Habermas, 1996:379) was examined in relation to the mobile sound art work 'Tool for Armchair Activists'. I then argued how art can be one way to move issues from the periphery to the centre of public spheres, and illustrated this with the artwork 'Text-Fm'. In the light of these concerns, I discussed the mobile sound art platform 'smSage' throughout this chapter, focussing on the concept of the piece first, and on the actual experience of the piece later on, cumulating in a debate around the 'making' and 'breaking' of public spheres in this piece.

This discussion demonstrated how complex and difficult it is to 'make' public art spaces that can act as a public sphere. Even when working in an art space (installation at a festival), and with accessible technology (text messages) which are idealised spaces - it is difficult, always provisional and 'in the making'. In the process of 'making' the piece, I pointed out several ways this process broke down: when the technology was not working (i.e. it was not possible to contribute), when people choose not to contribute (i.e. just walk past) and when people did not hear or see the piece (because of the surrounding noise and the ubiquity of CCTV cameras). The text messages that 'make' 'smSage' can only be broadcast if the piece works technically and people do actually

send in messages, and the broadcast messages can only be heard if the urban soundscape the installation is positioned in does not drown out the 'voice' of the piece. This illustrated the complexity of 'making' a mobile sound art platform.

'smSage' and the other artworks discussed in this chapter were examples of the category *sound platforms* that I developed in my taxonomy of mobile sound art. The artists build the platform, the audience contributions make the piece - this is how they operate in a nutshell. The building of the platform and the audience contributions are of course intrinsically linked. This chapter has highlighted how difficult it is to build such platforms where the audience contributes to the piece, making the artwork by mobile media interaction, and it is precisely because the contributions by the public are *required*. This makes the spaces made by these platforms so fragile: they require more generosity from the people participating than often acknowledged by the artists.

I argued that critical engagement with the - physical, social and media - context of the platform is crucial for the audience to take up the invitation of contribution to the platform. The public needs to have a desire to engage with the piece, for example by sending a text message. Those platforms ('textFm', for example) that were situated in a body of discourse, an existing discussion had more 'small texts' to establish a temporary public sphere, than those who were more focused on the technical aspects ('smSage' for example). This suggests that situating platforms of mobile sound art in an existing community or discourse, for example in relation to a contested issue (such as regarding the ownership or history of a certain public place) would allow for a more critical engagement with the relevant physical and social context, and thus allow for more 'small texts' to establish temporary but relevant publics.

This argument brings 'new' ways of public art where audiences contribute with mobile media back to established discourses of 'new genre public art' and especially com-

munity-related public art projects (see section 'Public and Dialogical Art', p. 40ff.). Criticisms of public art (e.g. who is in a position to give 'a voice' to the community?) and its sometimes dominating intentions (e.g. who got asked before somebody installed a statue that is supposed to relate to a neighbourhood?) and excessive expectations (e.g. how happy the community will be to engage) - remind us that public art does not work 'better' just because we use 'new' media, and art isn't 'public' just because it appears in a public place.

However, the presented examples feature a use of sound in public that is not commercialised (e.g. Muzak) and individualised (e.g. iPod). Instead the use of sound in these examples enables some sort of collaboration, where the process of communicating 'makes' the work of art by opening up the private communication (of text messages) to a public exchange. This is a slightly hopeful argument, hopeful that despite ever more commercialised public spaces and (mobile) media, artists find ways to open up alternative spaces, to establish local, episodic, fragile public 'sphere-lets' or micro publics. The making of these is idealistic, and difficult, but needed - even if they break.

VI. Polyphonies of Footsteps

This chapter examines 'Aura - the stuff that forms around you' (from now on 'Aura'), a 2007 art work by Steve Symons - an example of the category *Sonified Mobility* that I developed earlier (see p. 66 ff.). Participants equipped with headphones and a GPS-enabled backpack explore a city while listening to generative sounds that depend on their movement and location as well as on how many people have been in the same location before. 'Aura' has been shown at the 'Enter_' festival in Cambridge (UK) in April 2007, where I experienced it. The piece adds an invisible digital sound layer to the existing architecture of Cambridge. It forces you to move, as standing still produces increasing 'noise'. Because earlier participants have already left behind a trail of 'noise', you are 'forced' to move onto un-walked territory. 'Aura' changes your perception as you pay attention to a different architecture, to the sound art layer added by the artist. The experience provokes you to re-examine your senses and makes you think about the use of space and about the sharing of space. One participant recalls her experience as follows:

> I was deliberately trying to find places where I didn't think people had been before. The sound was horrible when I first put it on. It was very loud, I had to pull the headphones away from my ears. Very urban and gritty sounding. And then, as I walked towards the trees it just fell silent, and it was really lovely hearing, something that was really mad suddenly became silent. (Sarah, 2007)

This accounts by an 'Aura' participant gave us a first impression of how people experienced and described the piece. I conducted seven semi-structured interviews (15 to 30-minutes each) with participants after they returned from their 'Aura' walk, took field notes, photographs and video.[113] I also conducted an hour-long interview with the artist Steve Symons on site, and participated in 'Aura' myself. The interviewees proved to be

113.I carried out the field work during the Enter_ festival on Friday and Saturday, 27-28 April 2007. All interviews were anonymous (names invented).

very articulate in discussing their sonic, embodied and mobile experiences. This chapter discusses the themes that were articulated in the interviews with participants and the artist in the light of de Certeau's arguments around spatial practices in urban space - for example the distinction between views from above and maps as *reading* and the embodied mobility of walking paths as *writing* - as developed in *The Practice of Everyday Life* (1984).

1. The GPS Sound Piece 'Aura: Sonifying Mobility

'Aura' was premiered at the 'Enter_' festival in April 2007 in Cambridge (UK) when this festival took place for the first (and only) time.[114] The main festival area was located on 'Parker's Piece', a park in the centre of Cambridge, consisted of various white, dome-shaped tents and was free of entry (figure 43, page 188). The 'Aura' check-out station was located in one of these tents (figure 44, page 190), alongside various other media and sound pieces many of which invited the audience to explore the urban environment. The fine weather on this spring weekend enabled most festival visitors to enjoy the sun outside and not spend much time inside the tents.

114. The festival topic was "Unknown Territories" and its website advertises it as "exciting festival of interactive and playful public art events, live performances, a conference, workshop and club nights taking place throughout Cambridge" (Enter_, n.d.).

Figure 43: The main 'Enter_' festival area on Parker's Piece, Cambridge (UK), 2007

The central Cambridge Park 'Parker's Piece' was a busy public space with many people enjoying the good weather on one of the first fine spring weekends that year. People were walking on their own and in groups, some with children or dogs, either 'going for a walk in the park' or just crossing the green on their way about town. Many people also spent considerable amounts of time in the park with all sorts of activities taking place: picnics, football games, people watching, cricket practice, children's games, etc. Each of these groups occupied their own chosen section of the park, marking football goals with bags and coats, using trees for shade, putting down blankets as tables, and so on. This existing busy outdoor setting formed the backdrop for several of the mobile media pieces that were part of the 'enter_' festival, and 'Aura' was one of them.

The 'enter_' festival was one of the groups occupying space in this park, although in a more organised and permanent way than the other park visitors. It consisted of a group of white tents, housing a reception area, a cafe, and exhibitions of artworks. The festival area was intended to be open and free to attract a wide audience. However, as many artworks relied on specific technology and equipment, the camp was surrounded by fences (and there were also several security guards), and thus did not look as inviting as I would have imagined. The festival was free of entry to make it open and inviting to passers-by. But in fact the vast majority of people I observed and talked to in the camp were designated festival visitors (from Cambridge and from the UK).

The tents forming the camp had a special 'dome' shape which was visually very appealing, but as they held their shape by being inflated (much like a bouncy castle) they were a challenging environment sonically. The fans inflating the tents produced a constant background sound that made it difficult to listen to those pieces that relied on sound. 'Aura' (and several other mobile pieces) were not situated in the tents as pieces, but its 'base stations' where you would learn about the piece and take it out from, was in one of the tents (see figure 44, page 190). Before you could walk around the park with 'Aura' you had to find your way into the festival area and into this tent. This set-up framed the kinds of participants 'Aura' had, and thus my interviewees. They were not 'everyday' people walking through the park, happening to stumble across the festival and the piece. The interviewees were people already interested in media art who had decided to attend the festival, and 'Aura' was one of the pieces they experienced there.

Figure 44: Inside one of the festival tents, staff (on the right) is explaining 'Aura' to festival visitors at the 'base stations' (far right) that double as check-out point

'Aura' is described as "multi-layered soundscape immersive game" on the festival website (Enter_, n.d.). The artist labels it as "located sound project" on his website and explains that 'Aura' "explores notions of consumption and ownership within a space by allowing users to leave an audio trail as they move within the Real World." He chooses to describe the piece further by using a (quite visual) metaphor:

> Imagine a playing field after a fresh falling of snow. The snow lies evenly and untrodden. This represents an empty aura sound world and,if you wore an aura backpack, would sound like soft white noise. Someone walks across the field leaving footprints, the snow is sullied, eroded, the walker has left a patina in the world. In the aura world this patina is represented by filtering applied to the soft white noise. So a user walking with an aura backpack will hear soft white noise (virgin snow) then lower tones will emerge as they cross the path left previously by another aura user. (...) (Symons, n.d.)

In the interview I conducted, the artist Steve Symons further explains his motivation for creating 'Aura' and talks about the technology behind it. Again, it is interesting to note how he uses visual ("painting") metaphors in his account:

> It's about consumption (...) The interest in the idea that there is only a certain amount of art work out there and it gets consumed. So each user makes a path-, should make a permanent effect on it. (...) So we start off, everything is blank. and it's my virgin, pure world which sounds hüüa or eee or chichi, depending. And as soon as the GPS starts reading it starts painting on this world. (...) This consumption is shown in terms of that the sounds change, they get more distorted. (...) Because people are coming out of the back of our domes. (...) This is all consumed. So people have to walk further and further. (...) Little spots emerge which haven't been consumed. So you get little deposits of value. (Symons, 2007b)

The whole 'Aura' system consists of stationary base stations (figure 45, page 192) and mobile backpacks (figure 46, page 193) and is designed to be self-sufficient, to function without the artist's supervision. The base stations are located in one of the festival tents, and serve as check-out desk for the backpacks. The base stations also visually display previous participants' paths on their screens. The backpacks contain a custom-built computer, attached to large, binaural headphones. The sound of the piece is not pre-recorded; it is generated in real-time, depending on the participant's movement and on prior 'consumption' of sounds by others. 'Aura' is a custom-made, open-source surround sound system. Symons explains the system design of 'Aura', outlining the development of the backpacks and the software:

> The backpacks are bespoke systems, they are the worlds first solid state Linux surround sound systems! (...) As far as I know. Six channel Linux. It's all using open source software. (...) I have used Java (...) And for the sound I have used Supercollider. (...) Plus there is associated hard ware for compass and GPS, and then there are battery issues, recharging. And what happens when you plug it in. Then it has to talk to the server, so there is a network. (Symons, 2007b)

The technical side of this piece is quite complex, and illustrates another approach to working with more off-the-shelf solutions like mscapes.[115]

Figure 45: Two of the 'Aura' base stations in one of the tents. The screens were supposed to display the visualisations of previous participant's paths and headphones would allow listening to the corresponding sounds

115.see also chapter section 'Screens and Walking' (p. 254ff.).

Figure 46: Custom-made hard- and software inside one of the 'Aura' backpacks

2. Mobile Tactics and Polyphonies of Footsteps

Although 'Aura' is a sound work, it also has a visual aspect: the trails of people's walks are displayed on the base stations (figure 45, page 192). In the interview, the artist noted that he was not happy with the audience reaction to this visual aspect of the piece: "I'm a bit upset, everyone is obsessing over seeing their map. And that's the last thing I want them to do. (...) I want people to walk". I asked Symons to explain how he came to incorporate this visual aspect, especially as his earlier "Aura 1" from 2004 did not feature any screens. He replied:

> Two things. One, they need to have a recharge point. And two, 'aura 1' the galleries were going: what's in my gallery when aura is out? Bags? ID? And people were like: 'Oh, not very...' And I get little tables in the corner, and people put all their coats on there cos' they'd see all my backpacks. So it got a bit like, ok I need to work in installation more. (Symons, 2007b)

The artist is not entirely comfortable about the visual mapping and I share this unease. This is also why I choose not to use mapping (e.g. by visualising participants' trails) as a method of researching how the pieces I looked at 'worked'. The artist explains how all the different aspects were negotiated in the design of the piece, and especially the relation between walking and visuals:

> There was this massive designing working out what goes on at these base stations. (...) so there's [the] base station [he is drawing while talking], walking, so listening, and then, (...) returning to base station. If these base stations are too satisfying, too interactive, they not gonna walk. And it's the walk that I want people to do. The art is walking. It's not here. This is just a practical lure. Ok, it looks nice, a nice box. (Symons, 2007b)

This distinction between the visual mapping at the base stations and the embodied walking out in the park resonates with de Certeau's concept of strategies and tactics, where walking is understood as tactical, mapping as strategic. For de Certeau strategies belong to the sphere of institutions and power structures, whereas tactics are the realm of everyday actions by ordinary people in the strategically-structured set up of society and the reception of de Certeau's concepts has often focused on the potential of resistance in the tactical realm. Mapping is "flattening-out", to use De Certeau's term: "time and movement are thus reduced to a line that can be seized as a whole by the eye and read in one single moment, as one projects onto a map the path taken by someone walking through a city" (Certeau, 1984, p. 35). The ease and pleasure of appropriating the temporal activity in one glance, as opposed to the effort of walking and listening, is what makes the artist and myself feel critical about the visual part of his work - and explains why galleries and curators are so attracted to it. From the above artist statements we can understand how Symons was ambiguous about the path visualisation of 'Aura': While it satisfies the quick gaze of the passing festival visitor and has a more robust presence in the gallery, the 'real' piece is in the act of walking (away from the screens).

Figure 47: An 'Aura' participant (red shirt) is walking out of the festival area into the park, where other people are going for a walk (left) amongst many other activities

De Certeau has been discussed in the context of mobile art and hybrid spaces but not with a focus on sound (Souza e Silva, 2004; Altena, 2006; Kluitenberg, 2006; Kraan, 2006). One of those considerations of De Certeau is by Tarkka, who notes that "The 'locative gaze' conflates a god's eye view - the frozen military 'view from nowwhere' of satellite vision and atomic clocks - with the situated, embodied 'pedestrian perspective' (...) coincid[ing] with Michel de Certeau's distinction between strategy and tactic" (Tarkka, 2005, p. 17). Tarkka elaborates: "The participatory annotation of urban space fits well into de Certeau's description of tactical practice - for what else is annotation than a writing in the margins, a commentary which is never taking the space over in its entirety?" (Tarkka, 2005, p. 20).

De Certeau is very aware of the spatial component of practice, and this is productive for mobile media: "In the technocratically constructed, written, and functionalized space in which the consumers move about, their trajectories form unforeseeable sentences, partly unreadable paths across space" (Certeau, 1984, p. xviii). Whereas the space and place relationship is often understood as space being the abstract concept and place being the lived-in space with some sort of meaning attached to it, in de Certeau's concept this operates the other way round. De Certeau divides space into viewed space and experienced space (which is process), and links this to his concept of tactics and strategies: "To walk is to lack place" (Certeau, 1984, p. 103). One main aspect of the piece 'Aura' is that the artist wants "people to walk" (Symons, 2007b) because "the art is walking" (Symons, 2007b) as he states in the interview. He adds in a public presentation of the piece at the festival that walking is a also "very instinctive" (Symons, 2007a). Even though walking is instinctive, it is still work: the labour of walking and the attention the participants need to pay while walking and listening to 'Aura' are asking more (embodied mobile and auditory attention) effort of the audience than most traditional pieces of both visual and sound art.

De Certeau draws our attention away from city planning and towards the actual situated activities, the space making practices of the inhabitants of a city that make do with the planned space in various different ways, in "swarming activities of these procedures" (Certeau, 1984, p. 96). It is then interesting to pay attention how these swarming procedures have changed with ubiquitous mobile media use. A close look at 'Aura' allows us to do this. De Certeau believes that "the spatial practices in fact secretly structure the determining conditions of social life" (Certeau, 1984, p. 96). And our spatial practices are mediated ones. He aims to "follow out a few of these multiform, resistance, tricky and stubborn procedures that elude discipline without being outside the

field in which exercised and which should lead us to a theory of everyday practices, of lived space, of the disquieting familiarity of the city" (Certeau, 1984, p. 96). This chapter is doing something similar, finding disquieting familiarities in the sonic world created by the participants of mobile art. To find procedures of how space is lived in the ever more commercialised and privatised urban spaces, with the technology designed and profited by the telecommunication industry. To find resistance, creative practices while avoiding any romanticising of these. 'Aura' is one articulation of creative space making practices, away from totalising views, towards the very activity of inscribing movement into space via sound.

De Certeau suggests "to locate practices that are foreign to the 'geometrical' or 'geographical' space of the visual, panoptic, or theoretical constructions" (Certeau, 1984, p. 93). For me this sounds like a call for switching to the auditory instead, but for De Certeau this other spatiality, these "practices of space" are a specific way of operating, "an opaque and blind mobility" (Certeau, 1984, p. 93). He juxtaposes the "planned and readable city" with this other city that is made up of spatial practices, "a migrational, or metaphorical city" (Certeau, 1984, p. 93). He switches from totalising vision to the movement of bodies.

The way GPS co-ordinates are often used in mobile and locative art projects can resonate with DeCerteau's totalising vision from the World Trade Centre (Certeau, 1984, p. 93).[116] The way one "sees" the movement of the city at once from the distance and the colour-coded GPS traces or urban journeys suggests that it is possible to grasp the city and the mobile movements it is made up from with one glance. Often it is forgotten or marginalised that the actual experience of these urban journeys, of movements

116.Of course, De Certeau wrote this before database or street surveillance, so he understands vision as 'the thing that sees', whereas in the age of CCTV (visual surveillance) and GPS (database surveillance) your body itself and its trajectory though space becomes 'seen' (see Andrejevic, 2009).

of bodies through the city are complex and cannot be grasped at once with their idiosyncratic, subjective, multi-sensory layered experiences. This experience is reflected in the following account of David, one of the 'Aura' participants: "I did feel slightly odd for the fact that I was walking around in circles but I was trying to get away from the sound" (David, 2007).

In *The Practice of Everyday Life*, De Certeau rarely makes sound productive in his descriptions. His accounts of everyday observations are strangely silent. For example, he talks about the "mute silences of memories". However there are few instances where he is attuned to the sounds of the world, for example he contradicts his 'silent memories' by recounting "a walk though the night, alive with sound" (Certeau, 1984, p. 15). He is talking about a visit to Brazil; and from the same trip he remembers "the songs of the Brazilian sausade" (Certeau, 1984, p. 15). Elsewhere, he discusses reading and talks about "grumblings, tics, stretchings, rustlings, unexpected noises, in short a wild orchestration of the body" (Certeau, 1984, p. 175). De Certeau's attention to sound seems to be connected with internal, bodily and private realms, with foreign cultures and with technologies (see the train description below) but not with the everyday or Western culture, and especially the public realm of the city is silent in his accounts.

Even when describing footsteps, as making up the city in their multiplicity of movements, weaving places together by this space making practice of walking, this is a mute account. There is no sound to the footsteps in de Certeau's description, no heels clicking, no trainers being dragged, no polyphony of feet running down stairs. He is concerned with the temporality and the movement, but not with the sound. I argue that sound is a good reminder of temporality and spatiality, as is travels over time through space: the echo of our footprints in the under-path is gone within fractions of a second while we are one step ahead already. The only time sound is mentioned in connection

with walking is in a metaphorical way: "Walking affirms, suspects, tries out, transgresses, respects etc., the trajectories it speaks. All the modalities *sing a part in this chorus*, changing from step to step, stepping in through proportions, sequences, and intensities which vary according to the tie, the path taken and the walker" (Certeau, 1984, p. 99) [my emphasis]. This focus on walking bodies and their trajectories is productive for mobile sound art: "The ordinary practitioners of the city live (...) they walk - an elementary form of this experience of the city; they are walkers, *Wandersmänner*, whose bodies follow the thicks and thins of the urban text, they write without being able to read it" (Certeau, 1984, p. 93) [author's emphasis].

De Certeau understands walking as a form of (tactical) writing and looking down on the city (the totalising views as he describes them from the top of the world trade centre) as a form of (strategic) map reading, so to walk is to write, to look is to read. Therefore you cannot read the city while you are in it, you can only write it, because the map is the authored work. For him, paths are what you walk through 'blind', trajectories you push out with your body, and they do not necessarily have to follow roads (even if they do). The fact that you take a meandering path, or the fact that you always walk *these* steps and not those steps is the process of writing your own trajectory. This trajectory is not known exactly to others before you actually perform it.

This distinction between views from above as reading and embodied movement as writing seems to be a fairly visual one to me. If we follow De Certeau's suggestion to "[e]scap[e] the imaginary totalization produced by the eye" (Certeau, 1984, p. 93) we should ask how reading and writing can operate in sonic ways, too. What is the auditory equivalent of a view from above, of a map, of a path? For sonic reading you might have to be in the midst of the city, as listening from above or from a distance gives you a faint din, and possibly a few soundmarks, but no 'overview' or map-like view of a city.

To 'read' the sounds of a city, there is no soundmap, you need to be in the streets, walking, listening to the city: to cars before crossing the road, to the tube pulling into the platform, the busker in the park, a conversation on the mobile phone, music spilling out of a shop, the wind howling around the corner. Listening and walking might have features of both writing and reading. The temporal effort of listening and writing also suggest this connection, whereas the scopic snapshot from above is also an effortless one.

In mobile sound art works such as 'Aura' the audience writes sound into space, but also reads the existing soundscape as well as the added 'virtual' sound layer at once. I argue that the distinction between reading and writing becomes less clear cut in an auditory context, where embodied trajectories might be able to do both: read and write.

3. Friction

One of the 'aura' participants' I interviewed is 27-year-old Ben who lives in London and works for a theatre company. He came to Cambridge for the festival to 'get some ideas' for a project he is working on. Ben recalls his 'Aura' experience: "I kind of felt a bit detached from where I was. So that the place where I was wasn't as important as what I was hearing" (Ben, 2007). By focussing his attention to the auditory layer of the piece, Ben felt "detached" from his surroundings. In his comment, the auditory space is prioritised over the physical environment, in a similar way as Bassett (2003, p. 348) describes mobile telephony where we are constantly shifting between "attention" and "inattention" and often "prioritise the auditory at the expense of the embodied and visual world" (see also p. 79 ff.). I suggest that De Certeau offers another metaphor that is useful for describing the economy of these different spaces we inhabit in the hybrid city. Whereas De Certeau's experience of the city, his footsteps were silent, his travelling by rail is all about sound:

> Only the partitions make noise. As it [the train] moves forward and creates two inverted silences, it taps out a rhythm, it whistles or moans. There is a beating of the rails, a vibrato of the windowpanes - a sort of *rubbing together of spaces* at the vanishing points of their frontier. These junctions have no space. They indicate themselves by passing cries and momentary noises. These frontiers are *illegible*; they can only be heard as a single stream of sounds, so continuous is the tearing off that annihilates the points which it passes. (Certeau, 1984, pp. 112-113). [my emphasis]

De Certeau describes the mobile technology of railway travelling with as '*rubbing together of spaces*' and this metaphor can also be productive for contemporary mobile technologies of mobile phones, iPods and mobile art. If the '*rubbing together of spaces*' cannot be read, I suggest listening to it instead. 'Aura' provides an opportunity to explore virtual and geographic, sonic and imagined spaces 'rubbing together'. 'Aura' seems to allow for an alternative spatial experience: "in a way ... it forces you to think about how you're walking through a space in a completely different way", as Ben described (Ben, 2007). I argue that we can conceptualise this "different way" of walking through space, the "feeling a bit detached", as various "spaces rubbing together" allows us to think about the kind of friction that is generated by all these different media, sound, social and physical layers rubbing together in our encounters with contemporary urban spaces. You need to wear the backpack and the headphone to experience this auditory space of this mobile art work. By participating in 'Aura' a new hybrid sonic architecture is produced, one that is temporal and embedded and embodied. It is not a commercial but an art space, with a different economy of power, for example, participants are allowed to fail, to take off the headphones, to invent their own path, to do it in their own time.

4. Sound and Control

The 'Aura' interaction with other participants happens over time. In theory several of the backpacks could be out on a walk at the same time. At the "Enter_" festival this did not happen as only one was working and charged at a time. Regardless of this, the concept of the piece is to consume the sound over time. You can detect traces of previous walkers, the trails of noise they left behind. Most mobile art projects work with the idea of 'positive' traces, of leaving something 'nice' or 'interesting' behind, such as messages for others, audio snippets, colourful trails. For 'Aura' the opposite is the case, you leave behind something undesirable, you do not want to go where others have been, you want to find the un-consumed areas, the pleasant white noise, unexplored space, as indicated by nice sounds. Others have left behind trails of noise before, taking away choice from us; they have consumed some of the nice sounds already. This equates to quite a lot of sonic control in 'Aura', as the noise makes people walk, forces them to explore virgin sonic territory. The artist had to negotiate these issues of control when he designed 'Aura'. His account is quite ambivalent:

> I can't, you can't make the audience do anything. I've realised. (laughing). Although I really want to make a maze. (laughing). That's a real control of it. I want to control them. They will do what I tell them. (laughing) (...) But even then, if you make a maze, with sound, where the walls are made of sounds, you know, you have to keep in the quite bit, people will just walk over them. So you can't... (Symons, 2007b)

At the same time the artist realises that he has no means to control the audience trajectories:

> You just have to try not to, I have decided. I make the system, I make it as flexible as I can. I set the direction of it and (...) And then let the users do their thing. Cos' if I try to anticipate everything ... I mean they can, like 500 meters square, they can walk in any direction, at any speed...there's nothing I can do about that (laughing)... (Symons, 2007b)

In this account he claims that participants can "walk in any direction" but if we take his above comment into consideration, it becomes clear that those areas that are already 'consumed' by previous participants are so unpleasant that they force later participants to walk elsewhere. The system the artist developed does control the audience trajectories by sonic means.

Another aspect of sonic control - in addition to the nice sounds vs. noise - is the volume control of the sound. David felt like he could not escape the noise, the only control is removing the headphones: "there is this noise you can't get away from. Mmmm other than taking off the headphones" (David, 2007). As I recall from my own experience of 'Aura', I found the piece to be very loud. While I was walking around the park, I tried to find the volume control on the device. Even though I had been told that there was none, I was still trying to find it. This issue of volume control is also illustrated in the audio recording of my own experience, in a conversation between a festival helper (Mary) and myself (Frauke): "Mary: you may need to pull it away from your ears a bit as you go out here because it's noisy, it's quite loud. (...) [Frauke: Right. So there is no volume control?] Mary: No. You just have to pull it away form your ears. It can be quite loud. Ok?" (Frauke, 2007a).

The issue of control and sound adds to the discussion around mobile media and music in urban space and how people aim to control the experience of urban environment and their moods with mobile music (Bull, 2000; Bull, 2007). 'Aura' has an ambiguous relationship to sonic control: We do control the sound by inscribing a path of noise, but at the same time, it is not music of choice, but noise we have no control over - and also we have no control about previous participants trails of noise we encounter.

5. Feeling Self-Conscious

Another theme that comes up in all interviews is the participants describing how they felt self-conscious. This is interesting in relation to their everyday mobile media use. Mobile media use in everyday life has becomes increasingly invisible, non self-conscious. The more invisible technology becomes, the less self-conscious we are about using it, as illustrated by the spread of the mobile phone. Nowadays, having the mobile phone with you is the default and non-self-conscious "feeling". One is only is conscious of it in its absence, as Ben's statement illustrates:

> I was really conscious of it [Aura] in a way that I'm not particular conscious of my phone anymore. Although that's always a weird one, isn't it? Cos I, if I ever leave my phone then I'm very conscious of not having it...and I remember when I first got one feeling very much like I was connected to something, something new and something else ...and ... yeah so I think there is definitely something akin to that early feeling of when I first got a mobile phone. (Ben, 2007)

The participants are not self-conscious of their mobile phones but they are of participating in 'Aura'. They try to locate this feeling in the actual technology. Ben, for example, felt quite self-conscious about walking around with the aura equipment, and this also shaped his walk.

> I think, it's quite weird because you're kind of walking around feeling expectant of something to happen, and my focus was definitely on the fact that I had this thing, this equipment with me and also, you do get a few strange looks from people with this weird thing on top of your head and people are not quite sure what to make of you. (Ben, 2007)

David - in his late-twenties, "quite intrigued by ... all sorts of installations (...) sound installations", from Cambridge and "a film maker" (David, 2007) - also felt self-conscious, he first mentions the equipment and then realises that he is not the only one equipped like this. His next explanation is that his movement in space made him feel self-conscious, as this did not match the common walking around the park expectations.

> It was kind of a bit unusual experience because it wasn't like you stand out wearing a headphones and a backpack cos' more people wear headphones and a backpack. I did feel slightly odd for the fact that I was walking around in circles but I was trying to get away from the sound. So probably people, (...) seeing me walking around with these weird shaped [headphones]. (David, 2007)

David tried to inscribe his name onto the space, claiming territory, using the virtual space to claim physical space, to make the hybrid space his own by walking his name - and again feels watched, self-conscious.

> And the other thing which I realised that you could do with the GPS was that you can, once that's traced, you could write letters and things like... I was trying to spell my name out on Parker's Piece, so that was probably something else that people might have been watching me. Sort of what the hell is he doing. Kind of walking around in sort of strange shapes. (David, 2007)

Emma is from Norfolk but "used to live near Cambridge". She is thirty-three and works with her "husband in a[n] artist collaboration". Emma is quite self-conscious about her media use in general, and also about mobile media use in public. Not fitting in with the crowd, standing out by unusual mobile media behaviours, such as stopping while every-one is walking, make her feel uncomfortable, even vulnerable. This unease also applies for her 'Aura' experience: "But also because cos' you've got this big thing on your head you know that people, you're looking different, you're not blending in like you normally do (laughing)" (Emma, 2007). Later on in the interview she tries to explain her aware-ness of other people by her changed sense of hearing: "I think I was just really aware of all the people on Parker's Piece. I had to sort of negotiate a football game. And I felt like I was more likely to be kicked by a football because I couldn't, I didn't have my own hearing. You know what I mean. I was locked into this ..." (Emma, 2007).

In my own recorded experience of walking 'Aura' there is also evidence of myself feeling self-conscious and also my struggle to explain it with the gear I'm wearing.[117]

117.I am using my own recorded comments alongside the interviewees and the artist's. This enables me to work with three distinct voices for talking about these experiences.

Trying to work out what is different to the other people in the park using mobile media. In addition to wearing the backpack and headphones, I was also carrying a small voice recorder and more or less constantly talked into it about my experience, adding to the weirdness of my behaviour.

> People are giving me odd looks. I'm not sure if that's about the headphones or whether it's because I'm talking into my voice recorder. Maybe I should pretend it's a mobile phone.... But I can't really pretend it's a mobile phone because I'm wearing headphones so it doesn't make a lot of sense. (...) There's quite a lot of people walking around with headphones. Less obtrusive ones than mine. But lots of people walk around listening to music. Also lots of people on their phones walking along, talking on their mobile phones. (Frauke, 2007b)

Wearing the small 'Aura' backpack and the headphones does not make you look any different than music aficionados you meet in the city. Still the participants felt self-conscious about walking around with the 'Aura' equipment, as we can see in the above comments. I suggest that the unease has not much to do with what the participants look like with the 'Aura' equipment. Rather, I argue that it is located around the perception of self and others, and this perception is shaped by the experience and this is shaped by the content, i.e. my own music on the iPod, the artist's sounds and noises, an unexpected phone call. I suggest that feeling of self-consciousness, of feeling different, is also located in the altered experiencing of the space, altered by participating in an art work, perceiving the world in a different way through exploring the sounds generated by themselves and others. Feeling self-conscious is not only about the devices, it is about altered sense perception.

How the participants of 'Aura' feel self-conscious is also partly explained by the fact that it is a 'discomfort walk' where you hear noise if you cross a previous participant's path. This makes people feel as if they are not doing the 'right' thing. The park where 'Aura' takes place is full of 'noise', full of artwork in many places already. Additionally, the park is also full of all the 'normal' park visitors that are walking around, having picn-

ics, playing football, etc. Inside the park you have to negotiate this busy physical space, making sure not so step on other people's feet, into their paths, avoid being hit by balls. Inside the art space of 'Aura' you are also trying to avoid to step on someone else's path to avoid the 'noise'. This double navigation of 'spaces rubbing together' required by the audience also contributed to the feeling of self-consciousness.

In Aura, the senses are not ordinarily mobilised. This departure from "normality" can then be used to pinpoint this very normality. In everyday life we multitask, we do many media and non-media things at the same time, whereas this art work focuses us on doing one thing at the time, to dedicate our attention. I argue that mobile sound art re-examines our senses in playing with everyday patterns and rhythms of sense perception - while at the same time working with our everyday (mobile) media skills. The 'Aura' headphones act as a kind of auditory picture frame for our senses.

6. Moments of Breakdown

Digital media experience (almost) always includes some moments where they are not working as intended or as expected. This section focuses on these relevant moments were media expectations break down. As 'Aura' is a sound piece, one would expect an experience of 'breakdown' would be associated with 'silence', with no sounds on the headphones. If you walk too fast, the system is unable to keep up with the GPS readings, and this results in the sound cutting out. Symons is aware of this: 'When I see people walking a little too quickly (...) I know it will jump. A bit like an LP jumping (...) the GPS works a bit slow and you might be better if you go slower' (Symons, 2007b). Ben describes how he was uncertain of what to do when he experienced this cutting-out of the sound:

> Well, I was a bit sort of confused when the sound kind of cut out at a few points and it cut out with a bit of a crackle. And so, and it sounded like the noise when wires have lost their connection. And I wasn't quite sure that's

> what happened. (...) And then I was like shall I carry on walking? Shall I take it back? (Ben, 2007)

In this quote 'not working' was indeed associated with the sound cutting out, the headphones falling silent. This supports my above suggestion that for a sound piece like Aura' to be experienced as not working one would expect complaints about silent headphones. However, for some people, the opposite seems to be true: silent headphones still give them the impression the piece is working fine. Some people went for a walk with an 'Aura' backpack that was not working at the time (e.g. the battery was flat). The artist recalls that some people still like the experience:

> But then people would still be coming back and be like "Oh wow, I heard all these wonderful noises". But then (...) part of the work is, it does amplify, it is designed to amplify the real world as well. (...) They would just walk around with non-functioning headphones and say this was an amazing experience. (Symons, 2007b)

For these participants the 'Aura' headphones functioned as 'auditory picture frames' for their senses, even though they were not working as intended. It did make the participants listen and appreciate their soundscape as "beautiful". A different (almost opposite) experience of 'Aura' not working is reported by John. For him, the main experience is failure - even tough 'Aura' works perfectly fine when he takes it out: "The trouble is that, that it didn't work. (...) I got what I call noise. (...) What is the purpose of the exercise?" (John, 2007). His account is interesting because the interviewee is very critical, even hostile towards the piece. John is 40-50 years old, lives "just north of Cambridge", is "a mathematician (...) engineer (...) musician and (...) interested in media" (John, 2007).

> One of my students there, he tells me that it didn't work yesterday, or something or they got it to work. So, I mean, it's a bit embarrassing because I always like to support things like this, you know. But I had to sort of question their favourable gloss on it. It's a shame really. At least I hope I understood what the goal of the exercise was. (John, 2007)

For John, 'failure' is not about silence, it is about noise. He does not seem to be able to make sense of this intervention into familiar soundscapes, to make sense of the noise. One explanation for John's experience of breakdown could be that he does not have the mobile media skills required: he is not experienced with iPods and mobile phones in the way the other interviewees were. He uses his mobile more like a 'proper' telephone, making phone calls. He is is not very aware that most people also use it for many other purposes, as the interview reveals.

If we return to De Certeau's notion of paths as writing and maps as reading,[118] we could extend this to 'roadmaps' of expectations we might have towards certain genres of art such as mobile sound art as 'reading maps', and the actual experience of them as 'writing paths'. There is a genre expectation in locative art (and more generally in interactive media art) that the sound I am contributing is additive and somehow 'positive, for examples in adding my voice to a tapestry.[119] In 'aura' however, the participants add and encounter unpleasant 'noise'. Arguably, in John's head, there was already a roadmap of sound art as 'adding nice sounds', a cliché genre expectation of how mobile sound art operates. Which means that this genre expectation, John's roadmap, has become a strategy, rather than a tactic. He had a sense of a map already in his head. And then that did not fit, as he was writing his path in the actual experience of the piece.

It is not only the audience that experiences unexpected and unplanned aspects of 'Aura'. The artist Steve Symons also had to make do with challenging conditions in developing the piece. Working in public space and working with digital media is always a process of adjusting to ever-changing contexts, especially when working within the economic constraints of art on the fringe. Symon's original plan was to encourage people to

118. See section 'Mobile Tactics and Polyphonies of Footsteps' (p. 193ff.).
119. see discussion of 'Urban Tapestry' in section 'Experimental (Mobile) Media Making' (p. 87ff.).

walk around a larger area in the city centre of Cambridge where the artist mapped several zones with different sounds:

> Cos' it's a city wide thing and I was looking at the political, how much you can move within spaces, and what spaces have been used for (...) and I talked to people and found out the University areas and then I mapped that with a mixture of tourist map (...) [I was looking] for areas which are closed off. Or areas which are used in different ways. Not physically, but on that conceptual cartography level. So I was just looking for social zones. (...) I made about (...) seven big zones of space which are the coloured map on the screen. And I made different sounds, there are different sounds that operate in each of those spaces. (Symons, 2007b)

The planned trajectory of walking though the city was supposed to be encouraged by the scattered locations of 'Aura' base stations.

> In theory there is a nice line where you've got Parker's Piece, Market, and Kettles' Yard [the three locations originally planned] at the top. And then that is a two kilometres square space. And there's the main artery there. So people will naturally want to walk down there but that will get consumed quite quickly so you know there will be, they'll start doing other walks. (...) That was the theory anyway, wasn't it? (Symons, 2007b)

However, during the the development phase of the piece the funding for creating the piece was cut in half. Also, the custom hard- and software system being developed by the artist is very complex.[120] Therefore, Symons had to adjust to the changing conditions and make do with the local environment. Two changes were made: Only one backpack and base station were working and charged at any one moment in time (not the intended four). And second, the area of the piece was shrunk from city centre to park-size. After resizing the 'Aura' area to Parker's Piece, the piece only works within this 'playing field'. If you walk outside this area, it will not work, there will be no sound on the headphones. For the audience and the artist there have been different moments of the piece breaking down that have provided us with an insight how different these moments of sonic media breakdown can be experienced and articulated.

---

120. As of 2009 no comparable system has been developed or made publicly available - the artist is still gathering funding to do so, and to benefit the mobile sound and music community with a public release version.

7. Ambiguous Mobile Media Experiences

This last section of the chapter is concerned with the participant's everyday use of mobile media. People walk the city in an aestheticised sound environment in their daily lives, e.g. with mobile phones and mp3 players. In his study of how iPod users aestheticise their urban journeys, Bull argues that both, mobile phones and mp3 players, are warming up urban space for the user, but at the same time they are making urban space more chilly for everybody else (2007, p. 12ff.). I am interested in the link between everyday and art experience, how they can speak to each other and inform each other. After discussing their 'Aura' experience, I also asked the interviewees about their everyday mobile and sonic media experiences. As this chapter shows, asking people to reflect upon their everyday mobile media practices directly after having participated in a work of sound art is productive, as this art experience has opened up their senses. The 'Aura' headphones act as a form of acoustic picture frame that enables participants to see and reflect upon their everyday mobile media use. The everyday mobile media experience such as mobile phone use is made conspicuous by the art experience.

One of the most striking findings of the interviews is how ambivalent the participants felt towards their mobile phones, as illustrated by Ben's comment: "You know there is something really useful about having a phone but at the same time there's a burden that goes with it cos' you can't just go I'm just gonna go off now. Leave everything behind" (Ben, 2007). Paul also feels ambivalent about mobile phones as we can see in the following two comments:

> I use a mp3 player every day. I commute to London, so I use that to listen to music. It can play video but I don't tend to use it for that, I just use it for music. I've got a mobile phone which I tend to use very little, as little as possible (laughing)...I like them you know but I like to be able to be contacted. They are very useful but I find them a bit intrusive and a bit

> annoying at times. (...) I just find that they take people's attention away from from wherever, from whatever they are doing at that time. (Paul, 2007)

Both Ben and Paul first stress the usefulness of mobile phones before admitting to also finding them "intrusive", "annoying" and "a burden." Bull identifies a major difference between mp3 player use (such as iPods) and mobile phone use in terms of control and continuity. Music listeners choose their music and have a continuous experience whereas receiving a phone call is beyond people's control and disruptive. According to Bull, "[t]he two technologies represent two distinct, and largely contradictory, modes of relating to the management of time, space and 'otherness' in urban life: the *continuous* and the *discontinuous*" (2007, p. 67) [my emphasis]. This is reflected in Paul's comment above, where he states that mobile phones are "intrusive" and "take attention away".

The more continuous experience of being in a "bubble" of sound surfaces in my interview with David. His iPod use is interesting because he feels ambivalent about it and his description switches between his own use and that of "others", his account oscillating around pleasure and danger:

> I use a an iPod from time to time. (...) everybody is becoming more and more obsessed with these things and (...) it's kind of weird cos' it's all, in your own kind of bubble. When you start noticing you are doing it itself, if you are doing any activities or you're cycling and you've got the headphones in, just ... cycling with headphones, I'm slightly uncomfortable. So I just feel like quite sort of dangerous. (...) From time to time, you know if I'm going for a long cycle ride, it's quite quite good fun. To have some good tunes and just ride the road, it's good. (David, 2007)

Bull reports that iPod users are "expressing ambivalence towards their [mobile phones]" (Bull, 2007, p. 67), whereas his accounts of iPod users do not show ambivalence. In David's account we can see that ambivalence is also felt towards mp3 players. In my interviews, the mobile phone accounts were oscillating between "useful" and "annoying"; this iPod comment is torn between the "danger" and the "fun" of listening to mobile music.

In addition to these ambiguous feelings towards their mobile devices, interviewees also reported many creative ways of using mobile media. One of them is Ben's use of voice mail. There is an interesting tension between the playful and creative way Ben uses technology and how he thinks of himself of being shy to use features of his mobile phone. I asked him about any musical or sonic use of mobile technology and he replied:

> A couple of weeks ago I did in fact sing happy birthday down the phone to a friend of mine. (...) I [am] often actually bored of leaving just ordinary messages on the phone cos' I'm a sort of theatre person I suppose, I often (...) just make up characters and leave stupid voices and stupid messages on the phone. (...) Little improvisation sessions. To while away the minute. But I think other than that I tend to use things pretty much for how they are designed. And actually a bit shy of using my phone to do all the things it can do. I'm not, not sure why it can do all the things it can do. (Ben, 2007)

Despite his creative use of telephones (such as making up characters and stories, as well as singing) he describes his telephone use as following the design, and even as shy. From the 'everyday use' sections of the interviews I finally mention an account that contradicts our expectations of media activities being carried out while doing something else, as multi-tasking:

> Well, I use my mobile phone. (...) I use the computer. But I'm very dyslexic so I find it quite hard to navigate the Internet or respond to emails. You know, I do it a little bit, but I feel I have a disadvantage because I can't read very well. What other technology? I use a camera. [Me: So you more likely to use an maybe an iPod or listen to music?] Yeah, no, I don't. And I don't listen to very much music. (laughing). (...) I find it hard to multitask. So I never have music on in the background when I'm doing something else. (Emma, 2007)

If we return to the earlier argument that I built on de Certeau's comment of 'spaces rubbing together', for Emma the 'rubbing together of different spaces', for example the auditory space of an iPod and her surroundings, might produce too much friction to bear. Discussing these everyday mobile media experiences after the 'Aura' experience has allowed me to access emotional and creative responses that are often difficult to uncover in interviews.

8. Conclusion

'Aura' is an articulation of creative space making practices, that allows us to shift our attention from the often totalising views and "flattening-out" of maps (Certeau, 1984:35) towards the activity of inscribing sound into space via movement. In 'Aura' the very movement through space generates sound - *Sonified Mobility* - the stream of GPS data is fed into the generative audio software. There is also sound if you do not move, a static GPS signal is programmed to generate increasing noise, to encourage you to walk. 'Aura' could be regarded as symptomatic of contemporary urban space, privatised space - where it is possible to move around, but often increasingly difficult to stop, to rest, to sit down, to linger, if it is not for a commercial reason.

Mobile sound art 'platforms' such as discussed in the previous chapter are often concerned with adding 'nice' sounds (e.g. people's messages as mumbled poems)[121] and similarly in *Sonified Mobility* the movement or trajectory is often sonified in 'pleasant' ways.[122] In 'Aura' people's trajectories are sonified as 'noise' whereas previously unwalked territory is experienced as 'pleasant' sounds. In discussing the experience of participants of the piece (including my own, and the artist's) I identified the key issues friction, control, self-consciousness, ambiguity, and 'break-down' in these accounts. Across these themes, the audience has experienced the piece with some discomfort, with some dissonance.

The form of the encounter is in the sensory register rather than in the rational one (of sending text messages, for example). If the chapter around 'smSage' has been about enabling communication to make (and break) transient micro public spheres in public

121. see chapter 'Making and Breaking 'smSage'' (p. 175ff.).
122.see chapter 'A Taxonomy of Mobile Sound Art' (p. 48ff.).

space, this chapter has been about co-existing in spaces in a way that is painful and difficult, where participants are (almost) stepping over people and falling over an artwork. The polyphony of the piece makes is dissonant, it is a visceral dissonance of sharing public spaces in asynchronous ways. 'Aura' is not about rational forms of communication; it is about a visceral experience. In 'Aura' art space and everyday space are co-existing in the same park in Cambridge, and the tensions of this co-existence, the friction between these spaces is what has allowed an insight into the sensory media experience of participants.

The social aspect of 'Aura' evolves over time, without interacting directly with others. The idea of having some sort of shared social space without having to interact directly with other people might be typical of hybrid space, illustrating the ambivalence of wanting some social contact, while staying in the secure status of not communicating with strangers. There might be a desire to warm up more than your own space, or a desire to not cool down the urban environment by warming up your space (Bull, 2007). 'Aura' provides an opportunity to explore virtual and geographic, sonic and imagined spaces 'rubbing together' via sound (Certeau, 1984, pp. 112-113).

VII. Rhythmanalysis. Lefebvre on a GPS Sound Walk

'Core Sample' is an example for the category *Placed Sounds*. In these kinds of sound art works sounds are distributed in space by the artist and are then experienced by the audience who 'remix' their own versions of the piece depending on their paths.[123] This chapter understands the 2007 GPS sound walk 'Core Sample' by Teri Rueb as exploring the relation between the topography of a landscape (Boston harbour island) and its various rhythms (contemporary, historical, technological), as translated into sounds.

Two related processes make up the audience experience of this piece: the artist designing and distributing the sound, and then the audience experiencing them via walking and listening. After explaining the context and location of the piece, this chapter (counter intuitively) focuses on the audience experience first (section 'Audience Experience of Placed Sounds in 'Core Sample': Unwrapping Bundles of Rhythms', p. 217ff.) and then on the artist process (section 'Rhythmanalysis as Artistic Methodology: The Making of 'Core Sample'', p. 242ff.). I argue that Lefebvre's rhythmanalysis is productive for unwrapping the different sounds and rhythms the audience experiences when participating in 'Core Sample'. This chapter follows Lefebvre's understanding of rhythms as metaphorical, not musical. What I want to show here is how the artist works like a rhythmanalyst, how making an artwork can be understood of as an outcome of rhythmanalysis, and finally I want to argue that the artwork operates like a moment of sensory crisis for the audience.

Lefebvre is concerned with the poetics of everyday life and I draw on his concept of rhythmanalysis for the domain of art. Art experiences are out of the ordinary, the

123. See section 'Placed Sounds' (p. 49ff.).

everyday. At the same time participants draw on their everyday media experiences as a frame for their participation, and they might take something from the art experience back to their everyday lives. Artworks that are situated in everyday contexts and work with familiar technologies, as is often the case in mobile (sound) art, could arguably be regarded as more embedded in everyday life than more traditional art events such as a visit to the gallery or the concert hall and this is why I argue Lefebvre's everyday life concept of rhythmanalysis can be productive for analysing the experience of this piece of mobile sound art.

1. Audience Experience of Placed Sounds in 'Core Sample': Unwrapping Bundles of Rhythms

'Core Sample' is a GPS sound walk situated on one of Boston's Harbour Islands (Spectacle Island) in summer 2007. The Institute for Contemporary Art (ICA) booklet and the website for the 'Art on the Harbor Islands'[124] exhibition labels the piece as "interactive sound walk" and visitors are invited to "[b]orrow headphones from the Island's Visitor Center and then roam the island to experience a landscape of sounds activated by GPS (...). Discover unique combinations of natural and processed sounds - that correspond to the Spectacle's many subterranean layers, as well as its present soundscape" (ICA Boston, 2007, p. 5).[125] Participants walk around the island with a small pouch containing a GPS-enabled PDA, connected to open-cell headphones and a volume control (see figure 48, page 218).

---

124. Please note that the description of 'Core Sample' on the ICA website is slightly different to the one in the printed exhibition booklet (see figure 49, page 219).

125. There is also a sculptural part to 'Core Sample' that was exhibited in the Boston ICA. I argue that it is an almost entirely different piece and therefore this chapter only deals with the actual piece on Spectacle Island, not with the indoor installation. The exhibition booklet describes the sculptural part of 'Core Sample' as: "interactive sound sculpture in the ICA's Founder's Gallery - opening onto a panoramic view of Boston Harbor - that offers another way to experience this audio piece" (ICA Boston, 2007, p. 5). An almost 30 meter long metal core with an etched pattern spanned was embedded with tactile drivers that make the entire object function as a speaker. At different sections of the sculpture sounds from the island installation playback at their corresponding 'depth' along the 'core sample'.

Figure 48: 'Core Sample' by Rueb (2007). The ipaq in its pouch (left), the exhibition guide with the map (middle), the headphones (right), and the Boston skyline on the horizon

The below illustration (figure 49, page 219) shows the two pages from the exhibition booklet that are dedicated to 'Core Sample'. The left-hand page includes a written description of the piece as well as a legend explaining aspects of the map that takes up the right-hand page. The legend explains the different sound zones that are mapped onto the elevation profile of the island's path system. On the black-and-white map of this island, most of the paths have been overlaid with lines in various colours, corresponding to the sounds as indicated in the legend: "Atmosphere, plantings, top soil/loam, central artery fill, modern landfill, settlement and industry 17th-21st century, native american landfill 500-1580, geologic core" (figure 49, page 219).

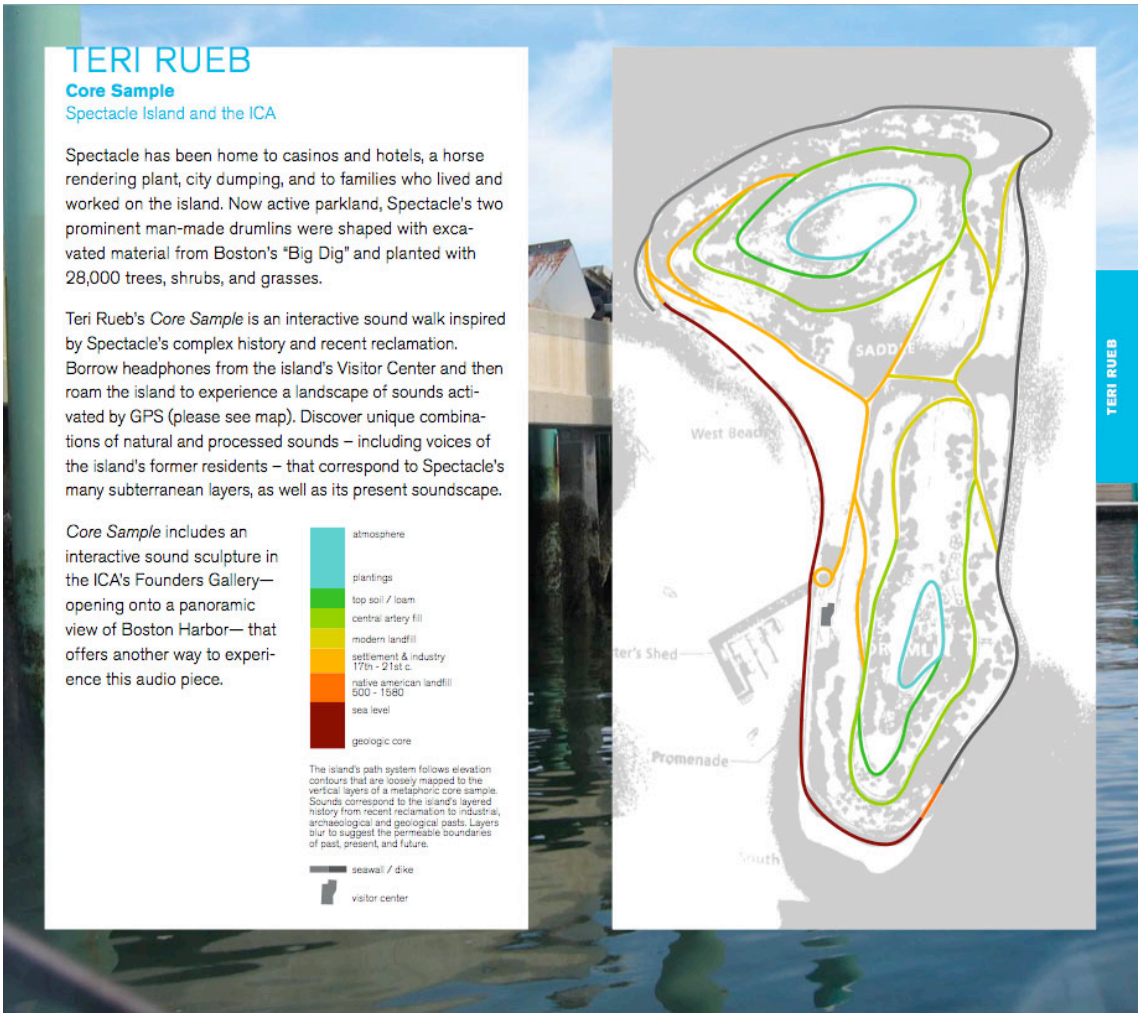


Figure 49: From the Exhibition booklet: a description of the piece with a map of the island that is overlaid with the colour-coded sound sections

'Core Sample' was open to the public from 23rd June to 8th October 2007.[126] It was commissioned as part of the exhibition 'Art on the Harbor Islands' curated by Carole Anne Meehan at the Institute of Contemporary Art (ICA), Boston. The ICA commissioned four artists to explore the "resources—water and sky, sand and city, historic sites and new trails, all just a ferry ride from the heart of Boston" (Boston, 2008, p. 5).[127] The

126.'Core Sample' won an 'Award of Distinction' at the media art festival 'ars electronica in 2008, interestingly in the category 'Digital Music' and not in 'Interactive Art' (Electronica, 2008).

127.The other three art works are: 'The Water Cycle' by Ernesto Pujol, 'Waterseide by Anna Schuleit and 'Voromuro' by Office Da; all located on different islands than 'Core Sample'.

curators stress the multi-sensory nature of these artworks, fitting in with the recent trend of focussing on multi-sensory aspects of art (see p. 7 ff. and (Jones, 2006)).[128]

Figure 50: View of the island (foreground), the sea and the neighbouring industrial landscape while walking

As 'Core Sample' is a site-specific piece, some understanding of this landscape is vital to understand the audience experience of the piece. The island has a varied history: most recently the closed toxic dump it was for the last decades has been turned into a National Park by covering it with soil from the 'big dig' (a huge tunnel project)[129] in Boston. The exhibition booklet gives a good overview of the island and its history:

> Spectacle has been home to casinos and hotels, a horse rendering plant, city dumping, and to families who lived and worked on the island. Now active parkland, Spectacle's two prominent man-made drumlins were shaped with

128.The ICA's Vita Brevis Program that sponsored the exhibition aims "to present temporary off-site works of art that respond to Boston's landscape and history" and its name "refers to the temporary nature of the projects" (Meehan, 2004). The exhibition won an award for 'Best Show in a Public Space', awarded by the New England Chapter of the 'International Association of Art Critics' (Cook, 2008).

129.The 'Big Dig' was a huge tunnel building project for a motorway through central Boston, that is referenced in the piece in the 'central artery fill' section of sounds.

> excavated material from Boston's 'Big Dig' and planted with 28,000 trees, shrubs and grasses. (Boston, 2008, p. 5)

More detail about this transformation process and the history of the island will be discussed throughout this chapter. On the island, a visitor centre and signs provide even more information (figure 52, page 222). Visitors reach the island by ferry (figure 51, page 221): the 15 minute ride costs 14 US Dollars (return) and the ferry operates more frequent in high season and on weekends (with a maximum of 10 ferries per day) while off season there are as little as three ferries a day and during the winter there is no ferry service at all (Boston Harbour Islands Partnership, n.d.). Visiting the island, and consequently 'Core Sample' is thus quite a commitment in terms of time and money.

Figure 51: Participants had to take this ferry from Boston Harbour to Spectacle Island

The National Park incarnation of Spectacle Island opened to the public in 2006 and proved to be very popular with visitors with traffic on the island much higher than any-

one expected, according to Rueb (Rueb, Conrad, & Behrendt, 2007:24'09).[130] She explains that on on an average weekend in the summer "the beach is packed with little kids and families and picnics and lifeguards" and some of them even brave the cold water and swim (Rueb et al., 2007:22'10).[131] And on "Memorial Day or Labour Day, it's like kids with ice creams and bathing suits and life guards, and Jazz quartets on Sundays, bizarre! It's like Coney Island - a public beach on a former dump" as Conrad recalls (Rueb et al., 2007:23'15).[132] The Island is also used for all sorts of private functions such as "Tours and company parties and family reunions and - weddings" (Rueb et al., 2007:24'09).

Figure 52: A sign with information about the island (not part of 'Core Sample')

130. Where the reference of interview material includes a colon or a 'p.' followed by a number, this number refers to the time in the recording of the interview (formatting issue with the reference software).

131. Being on the Island made me feel really uneasy. I was at a beach and thought I would really like to go into the water with my feet but then remembered that it might not be a good idea, as it might be somehow toxic.

132. Erik Conrad is Teri Rueb's partner and he was also involved with the process around 'Core Sample'. I interviewed both of them together.

1.1 The Audience of 'Core Sample'

Out of all case studies in this thesis, 'Core Sample' has the largest audience figures; overall 1200 people have participated in 'Core Sample'. More importantly perhaps, the piece attracted "a really broad audience", (Rueb et al., 2007, p. 44'30) "people from all different walks of life", as Conrad and Rueb recall (Rueb et al., 2007, p. 47'51). And Rueb adds:

> Some are specifically there to do it, and others just stumble upon it. (...) And it takes an open-minded person to subject themselves to something like this in the first place. Whether it's art or not in their minds. It does self-select to a certain degree for the open-minded. (Rueb et al., 2007, p. 53'30)

Conrad agrees that many people came out specifically to see the piece, whereas others "come out and they are just looking at stuff, and they think : 'oh there is something else to do on the island." He recalls one typical example: "Sometimes it would be a pair of guys thinking 'we were gonna walk on the north drumlin anyway and there is this audio thing, let's take it out, let's see what it is' " (Rueb et al., 2007, p. 44'30).

As I stated earlier, there is quite a lot of effort involved to experience this piece, and still it attracted a large and diverse audience. Conrad explains the audience effort in terms of time commitment "Even if you just do it and go out for a little bit and decide you don't want to do it, still it's like half an hour. (...) And it's still a huge time commitment compared to if you put a painting up in a coffee house" (Rueb et al., 2007, p. 47'51).

In terms of gender and age breakdown of the audience there are no figures, but some observations by Rueb: "We got a lot of age diversity" (Rueb et al., 2007, p. 51'15) and by Conrad: "We don't have statistics or anything but it seemed that there were more women probably overall than men. A lot of the time there women in pairs would come out. Or a mother and a horde of kids (...) sometimes really little ones" (Rueb et al.,

2007, p. 50'20). Rueb and Conrad both commented a few times on children taking out 'Core Sample'. Conrad recalls:

> Other times people came out who were like 'my kid is interested in art' or 'in art and computer stuff' and in fact these kids from ten to sixteen, they brought their kids up to do this piece. And the kids were totally jacked about. They really got it. They were really engaged. (Rueb et al., 2007, p. 51'15)

Rueb adds with regards to younger children: "There were kids aged six and seven that were fully able to embrace it for an extended period of time" (Rueb et al., 2007, p. 51'15). In Conrad's opinion getting children involved is quite a big compliment: "To get any response at all from any pre-teen or teenager... they just told you that they thought it was cool when they came back (...). And that is quite a big deal for a kid. because they (...) don't feel like they have to obligation to tell you ..."(Rueb et al., 2007, p. 52'00). Conrad also comments on the media skills of the children that are relevant to enjoying the piece:

> All these younger kids were into it. Partly, it seems to be more natural, they are more used to technology, they are more media savvy, I guess. But also, if you do interactive work, a lot of the times - even other kinds of things - you throw little kids in there and it is much easier for them to engage it, to do things that adults wouldn't necessarily do. (Rueb et al., 2007, p. 52'00)[133]

While young visitors embraced using the mobile technology as it fits with their everyday media experiences, some adults might have been inhibited by the headphones and mobile device, as Rueb recalls:

> I think some adults are just immediately turned off by the concept thinking 'I'm going on a walk, I don't wear my headphones, or I don't bring my iPod to the islands. I don't want to put myself into this...' They don't know anything about it, they just make an assumption. (Rueb et al., 2007, p. 53'30)

The (relatively) large and diverse audience is partly due to the success of the newly opened island and national park that attracted large numbers of visitors. This was the

133. The idea of involving children in the evaluation and prototyping of interface development, especially in regards to sound, has also been practised by by Kristina Anderson, see (Andersen, 2008) and (Andersen & Berzowska, 2006).

first hurdle, getting people to visit the island. The next hurdle was to attract the interest of the visitors in learning about the piece and then taking it out for a walk. The visitor's centre of the island where Conrad 'manned' the 'Core Sample' desk for almost the entire summer has been instrumental in this regard. A good public interface and infrastructure has been crucial for the piece, and is something that has not been the case in the same way for the other case studies. The third hurdle however is the time people actually spent with the piece, and how they talk about this experience. These two are only possible once the first two hurdles are taken. From the artist interview and Conrad's observations it seems that people did indeed spend extended amounts of time with 'Core Sample' and from the guest book entries (see below) we can see that about ten percent of the participants have been moved to write about their experience.

1.2 'Auditory Impressions' in the Guest Book

To investigate the audience experience of the piece I drew on my own experience,[134] guest book entries and the interview with the artists. As mentioned before, Conrad manned the handing out station on Spectacle Island for most of the summer and therefore had a lot of experience with the participants of 'Core Sample' and shared this in the interview. Rueb's and Conrad's observations are filtered through their role as artist and collaborator (to be kept in mind when analysing these accounts). Their comments and my own experience are analysed together with the guest book entries in the following section.

The 'Core Sample' guest book was left on the handing out/returning desk on Spectacle Island and 107 of the participants took time to leave a comment in it. The artist provided me with a copy of the guest book, I transcribed all the entries and I selected

134. On September 19th 2007.

key comments (anonymised).[135] Sample pages from the guest book are shown below (figure 53, page 226). Some of the people that left comments in the guest book were friends, family and colleagues of the artist, and they often address her personally. Their comments tend to be very positive, but not very detailed. Most of the comments I use here are (as far as I can tell) from visitors that do not know the artist. The guest book entries as research material are different to the audience interviews I did for some of the other chapters.[136] The interviews I conducted (for the chapter 'Polyphonies of Footsteps' (p. 186ff.) for example) were semi-structured and allowed for an open-ended conversation that often lasted half an hour or more, while the guest book comments I use in this chapter are much shorter, and more formal and often impersonal.

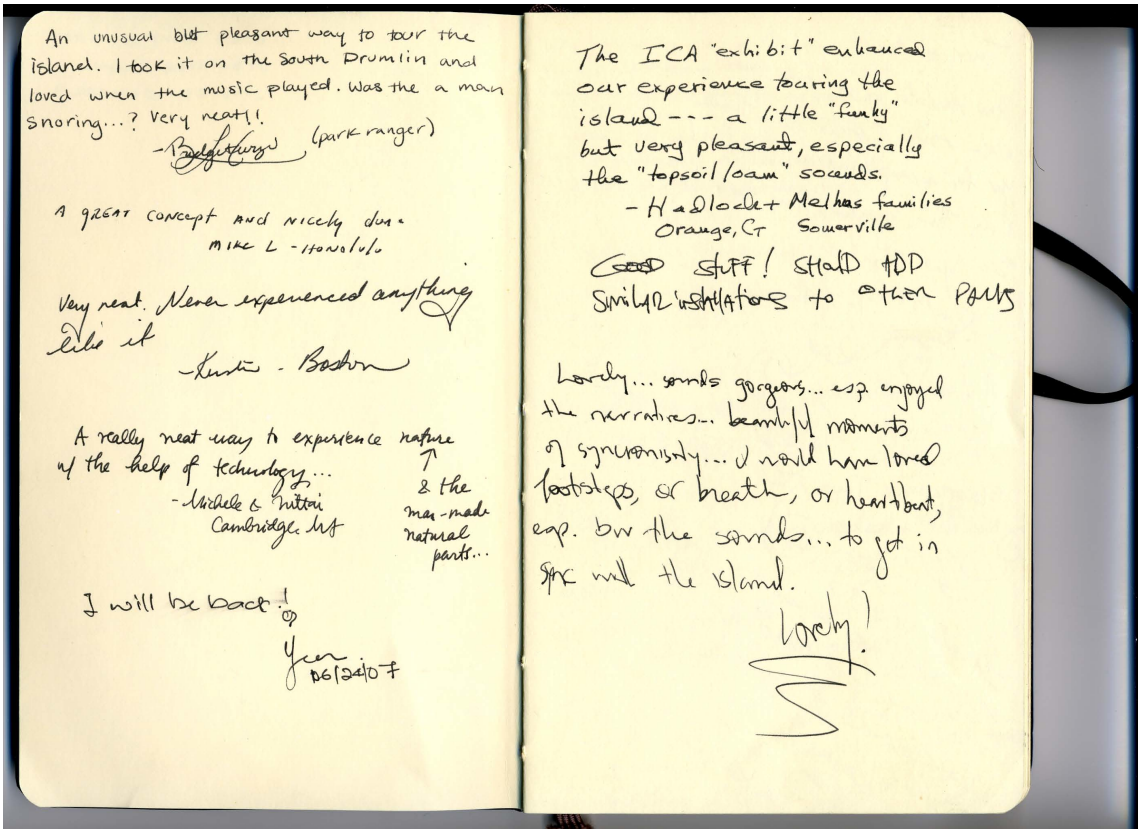


Figure 53: Page 2 and 3 from the guest book of 'Core Sample'

135. See also my discussion of using the guest book in the methodology chapter on p. 98.

136. For this case study I did not conduct interviews with other participants of the piece because of timing issues. I only spent one day on the island, as the piece was in a fairly remote location and I was in Boston for a short time. The day of my walk was at the end of the season and during the week, so not many people took the ferry out to the island, and I did not encounter anyone else taking out 'Core Sample'.

The material from the guest book shows how participants chose to describe their experience in writing. It is striking that the auditory vocabulary of the audience is quite well developed. For example, the audience used all sorts of sonic terms to describe the piece: "aural journey" (Guest Book, 2007, p. 7), "auditory impressions" (Guest Book, 2007, p. 10), "fun soundscape" (Guest Book, 2007, p. 10), "sound project" (Guest Book, 2007, p. 13), and "audio piece" (Guest Book, 2007, p. 26).

1.3 Lefebvre's Rhythmanalysis and 'Opening my Ears'

As we can see from the above comments, the audience is quite articulate about their sonic experience. I argue that the attention to sound and the surrounding soundscape has been framed and sharpened by taking part in 'Core Sample'. How in particular this framing operates on the level of the artist designing the piece and the audience experiencing it is discussed here in more detail.

One key theme in the guest book comments are remarks about the way sense perception is altered by the piece. These comments fall into two categories, one focussing on how the listening - not only to the piece but also to the existing soundscape - has been changed by participating in the sound piece; and the other category focussing on how the visual perception and attention has been changed by listening to the piece, evident in this comment where a kayaker visiting the island "started to really notice the beauty all around me in a new way" (Guest Book, 2007, p. 19) (this will be discussed below).

First, I discuss how participants' attention is directed towards their soundscape and surrounding rhythms as becomes evident from the following guest book entries. One participant thanks the artist "for opening my ears to a range of interesting + unexpected sounds! (Guest Book, 2007, p. 3). Other comments reflect upon the interpretation of sounds, and how these differ for everybody: "The sounds heard were very interesting

and [unreadable word] lends itself to varying interpretations. Although I am not sure I perceived the same things as others - it was a novel and different experience" (Guest Book, 2007, p. 9). This comment also reveals a level of uncertainty, the participant is not sure how her or his experience compares to that of others. Several participants felt that the sounds invited to wonder, as the following quote exemplifies: "It added so much to hear + wonder about the sounds we were hearing" (Guest Book, 2007, p. 10). In these comments the audience of 'Core Sample' left in the guest book we could see how they were listening to the island in a different way than they usually would.

Lefebvre's concept of rhythmanalysis is productive for analysing these guest book comments further as he stresses the importance of "listening out" to the entire sound-scape, and also to various layers and kinds of rhythms, as can be found in these quotes from 'Core Sample' participants. Before going into more detail about this concept I briefly introduce the larger project of rhythmanalysis in Lefebvre's writing.

French Sociologist and Philosopher Henri Lefebvre's classic work - especially the *Production of Space* (1991) - argues that space is a social construction, emerging out of a tension between a triad of spatial forms (natural, mental and social) and he distinguishes lived (representational) space, conceived (representations of) space and perceived space (spatial practice). In other work Lefebvre develops specific temporal ways of thinking about the production and use of space, including a later and less well-known work, *Rhythmanalysis: Space, Time and Everyday Life*, an investigation of this through the idea of different rhythms of actions and practices. While Lefebvre's understanding of space is largely visual,[137] his *Rhythmanalysis* has a multi-sensory approach and is concerned with the temporal. Rhythmanalysis has recently started to be considered in

137. Despite Lefebvre's interest in music and non-traditional art forms such as the Situationists, the themes of space and time did not come together via music in his writing, maybe because he was mainly concerned with Western classical music.

Media Studies (see Obert (2008)[138] amongst others) and in relation to mobile media (see Bull 2007).

The auditory activity of listening is one of the key aspects of rhythmanalysis for Lefebvre. The rhythmanalyst "is always 'listening out', but he does not only hear words, discourses, noises and sounds; he is capable of listening to a house, a street, a town as one listens to a symphony, an opera" (Lefebvre, 2004, p. 87) This quote addresses what it actually is to do rhythmanalysis by pointing to the urban landscape and the mode of listening. If we think back to the above comments from the 'Core Sample' guest book where participants wrote about how their ears were opened, how they started to wonder about sounds, and how they looked at their surroundings in new ways, one could argue that the participants are listening to the island "as one listens to a symphony".

In another section Lefebvre suggests "a sort of meditation" is required in rhythmanalysis: "No ear, no piece of apparatus could grasp this whole, this flux of metallic and carnal bodies. In order to grasp the rhythms, a bit of time, a sort of meditation on time, the city, people, is required" and this meditation could well be an artistic one (2004, pp. 28-30).

The methodological project of rhythmanalysis is probably the most productive aspect of this concept for analysing mobile media art such as GPS sound walks: Rhythm is a mode, or tool of analysis, not the object of research, for Lefebvre. How does he define rhythms? Rhythms occur "[e]verywhere where there is interaction between a place, a time and an expenditure of energy" (Lefebvre, 2004, p. 15). If rhythms are ubiquitous, and at the intersection of space and time, the business of rhythmanalysis then needs to be concerned with analysing these rhythms, unpacking them. Rhythmanalysis is an

138.Obert's "Sound and sentiment: A rhythmanalysis of television" (2008) uses Lefebvre and a focus on sound to argue against the prevalent textual analysis of watching TV.

"analytical operation"; with the aim of "opening and unwrapping the bundle" of rhythms (Lefebvre, 2004, p. 9). Exactly how this business of rhythmanalysis is supposed to work remains rather vague in this book, but there are some aspects that are useful for a rhythmanalysis of mobile art works such as 'Core Sample'. Lefebvre develops a framework for analysing rhythms with several aspects: and here I discuss a selection of them: repetition, the interference between linear and cyclical time, and his ideas around secret, public & fictional rhythms.

There is no rhythm without repetition, but - and this is often overlooked, as Lefebvre points out - difference is also key to rhythm (Lefebvre, 2004, pp. 9-10). Paying attention to those ever so slightly different repetitions is important for the rhythmanalyst. For Lefebvre there are rhythms in everything, "nothing is immobile" - just sometimes these rhythms are very slow so that humans cannot observe them directly; trees and stones are examples (Lefebvre, 2004, p. 20). From the level of atoms, to the soil of a forest, the trees, and the sun above - movement and rhythms everywhere.

Lefebvre distinguishes between linear time (clock time, mechanical rhythms) and cyclical time (lived time, organic rhythms) (2004, pp. 8-9). I argue that mobile art pieces such as 'Core Sample' could be conceptualised as articulating both cyclical and linear time, and especially their relation and interference. The technology of the mobile devices, the GPS and planes taking off and landing in the background, represent linear time. The walking, breathing, heartbeat of the participant stand for cyclical time. In the artwork both cyclical and linear time are articulated in the path walked by the audience while listening.

Lefebvre also distinguishes between secret, public, fictional rhythms and dominating-dominated rhythms. The public rhythms are at the same time social ones for Lefebvre: they are "[c]alendars, fêtes, ceremonies and celebrations" but he also includes a link

back to the public display of private, bodily states such as "digestion" and "tiredness"; he claims they are the ones we "exhibit as *virtuality*, as expression" (Lefebvre, 2004, p. 18) [emphasis by the author]. Fictional rhythms might include the arts and what Bourdieu calls habitus, as Lefebvre defines fictional rhythms as follows: "Eloquence and verbal rhythms, but also elegance, gestures and learning processes. Those which are related to false secrets, or pseudo-dissimulations (short-, medium- and long term calculations and estimations). The imaginary!" (Lefebvre, 2004, p. 18).[139] The secret ones are "physiological rhythms, but also psychological ones (recollection and memory, the said and the non-said, etc.)" (Lefebvre, 2004, p. 18). I suggest that we could understand the sound that Rueb chose and distributed on the island not only as fictional rhythms (where Lefebvre locates the arts) but also as secret rhythms, as they are memories of the past of the island. These secret rhythms, fragments of past rhythms are overlaid onto the existing rhythms and sounds of the island. The audience experiences both the current rhythms and sounds and the ones layered by the artist at once with the rhythms of their own bodies walking, breathing, etc.

"Might there be hidden, *secret*, rhythms, hence inaccessible movements and temporalities?" (Lefebvre, 2004, p. 17) [emphasis by the author] - Lefebvre answers this question with "no", he argues that "everything knows itself, but not everything says itself", urging the researcher to not mix up silent and secret. This is relevant because it links to Lefebvre's notions of public and secret (his idea of 'private'?): "One can classify rhythms according to these perspectives by crossing the notion of *rhythm* with those of *secret* and *public*, the external and the internal" (Lefebvre, 2004, p. 17) [emphasis by

139. The last category concerns "dominating-dominated rhythms", and as Lefebvre claims this category is "[c]ompletely made up" and is about "everyday or long-lasting, in music or in speech, aiming for an effect that is beyond themselves" (Lefebvre, 2004, p. 18). It is with this last category that the project almost becomes almost arbitrarily broad.

the author]. I suggest that secret rhythms that cannot "speak" of themselves can be brought into the public by the arts and especially through non-verbal, embodied practices such as sound walks.

If we think of these secret and public rhythms and 'Core Sample', this piece could be regarded as one way of how art can bring secret rhythms out to the public, to make rhythms that cannot speak of themselves 'speak' to the audience though the art. By approaching specific locations on the urban island in Boston harbour, participants are able to listen to otherwise silent or hidden aspects of the urban landscape. The audience is listening to secret, hidden rhythms that the artist has found elsewhere, in archives and in interviews; and she has brought them back to the location they are concerned with.[140]

Thinking about the rhythms of Spectacle Island and 'Core Sample' in terms of Lefebvre's categories as described above, produces a long list. A selection from it might include: The rhythms of the sounds as decided by the artist, the pace of the hiker, the rhythm of the satellites circling the earth, the rhythm of the waves and the tides of Boston harbour, of planes landing and taking-off, buoy bells in the wind, grasshoppers next to the path. "We know that a rhythm is slow or lively only in relation to other rhythms (often our own: those of our walking, our breathing, our heart)", states Lefebvre (2004, p. 10). In mobile media art, the rhythm of walking could be regarded as the one rhythm that relates to all the other ones. When analysing walking bodies in 'Core Sample' or other mobile at works, it is also important to reflect on the ways rational, numerical rhythms have the power to change body rhythms. Machines and computers change our heartbeat, breathing, posture - and in this case study the mobile devices affect the way participants walk.

140. For an example, see the discussion of rowing sounds below (see p. 247).

1.4 Audio-Visual Attention and Moments of Synchronisity

In terms of the changed sensory perception of the audience, there were two main themes in the guest book comments, and after discussing how the audience listened to their surroundings in different ways, it is now time to investigate how it them look in different ways, what kinds of audio-visual comments they left. One participant remarks on the unexpectedness of some sounds and how that lead to a different way of looking: "Unexpected sounds that made me look at my surrounding space in a different way" (Guest Book, 2007, p. 10). This extends my argument that participating in the piece made the audience listen to their surrounding sounds. Comments from the guest book illustrate that participants did not only listen in a different way, their attention in general was more focused on their surroundings, and especially audio-visual connections are frequently made. In the following, longer quote from the guest book, a sharpened attention to the participant's surroundings, and the intersection of auditory and visual perception becomes apparent:

> Great Experience - spent 2 hours. the music enhanced my way of seeing - I started to really notice the beauty all around me in a new way:
> – bumblebees drinking pollen on ragweed
> – dozens of dazed flies scoring over a field (as I heard sounds of applause on your track - great effect)
> – flowers blowing in the wind (with [unreadable] sounds on your track)
> – milky weed pollen blowing here and there in the aßir
> – sailboats with sails full of air
> – nice touch also with the voices
> could use a bit more intro to spoken sections
> could use few spoken sections as [unreadable] (there were none)
> (Guest Book, 2007, p. 19)

This 'list' of 'observations' points back to my own list of rhythms of the islands above (see p.232) and both are noticing these rhythms without narrativising them. Paying attention to the surroundings, the way the experience is framed by the artwork, also let

several participants and myself comment on synchronisity or non-synchronisity of various sensory events. One participant wrote: "Lovely...sounds gorgeous..esp. enjoyed the narratives...beautiful moments of synchronisity..." (Guest Book, 2007, p. 1). Another one recalls the experience as follows: "sometimes the sounds blended with the visual (roaring engines coinciding with passing planes/boats) and sometimes the sounds provided a completely new soundscape..." (Guest Book, 2007, p. 4).

These guest book entries are concerned with the relationship between different rhythms. Lefebvre describes four relationships between rhythms or alignments of rhythms: arrhythmia (a dissonance of rhythms), polyrhythmia (several rhythms without conflict), eurhythmia (several rhythms interact in constructive ways) and isorhythmia (rhythms aligned) (2004, pp. 67-69). This section is rather vague but productive for thinking about the guest book accounts in a suggestive way. Although I am not using his terms precisely (because they are not precise) I am talking about the different rhythms that people find when they explore the island and the piece. It points to the different possible ways the audience has experienced the relationship between various rhythms, as synchronous, integrated, disorienting or intensified, for example. "I loved the integration of your sounds with the natural sounds" (Guest Book, 2007, p. 6), as one entry reads. Another participant experienced the juxtaposition of both soundscapes and their rhythms as disorientating: "The mixing of the audio + natural sounds on the island was fun, disorienting, interesting" (Guest Book, 2007, p. 4). One comment focuses on specific sounds - weather sounds - and how they are not synchronous: "I especially like the sounds of other weather than the weather of this sunny windy day - it intensifies the experience. Like the sound of the rain water bubbling down the swaths [?] reminds us of what happens along the slopes when it rains" (Guest Book, 2007, p. 9). The artist also highlights the relationship between different rhythms and sounds in the interview: "little

moments where there is permeability between the sound that exists in the space itself and the recorded sound that you overlay" (Rueb et al., 2007, p. 1'10'11).

1.5 Site-Specific Immersion

In the same way that immersion and critical distance is often seen as exclusive, headphone listening and connecting to your environment is also often portrayed as exclusive. I argued against the exclusiveness of immersion and critical engagement earlier (see section 'Sound Art', p. 29ff.); here I argue against the exclusiveness of connecting to our surroundings and listening via headphones. The experience of 'Core Sample' is immersive, transporting the audience to a different space, but at the same time it allows them to connect with the location, and to critically engage with their surroundings.

In the quotes from the guest book, participants talk about how they listened in a new way, and not only to the sounds that were on the headphones, but also the the ones on the island. This is underlined in another comment that remarks on the sound of the wind on the island: "The sounds combined with the wind were just like a dream - Thank you for a wonderful journey" (Guest Book, 2007, p. 17). We can see that participants recall sounds with great detail, both natural sounds and sounds of the piece. They probably would not have paid attention to the soundscape in such a detailed way, recalling specific sounds later, if they would not have participated in the sound walk. This might seem strange at first, as participants are wearing headphones, listening to sounds provided by the artist. One might expect that this takes away the focus from the sounds of the surroundings. But this does not appear to be the case. From my own experience of 'Core Sample' I remember very well those moments where you cannot work out if a specific sound is from the piece or from the surroundings. I recall that a few times I was not sure whether I heard specific sounds on the headphones or in my environment. Sometimes it would be both at the same time, sometimes it would be slightly asyn-

chronous. For example, at some point I heard planes flying overhead. That really made me look up - and then I realised they were no planes. This reminded me that I did see planes earlier, but I could not hear them because the wind was blowing from a different direction than the airport.

Bull (2000; Bull, 2007) and others (Beer, 2007; Simun, 2009) have argued against the common claim that headphone users completely distance themselves from their surroundings, rather users are augmenting their (urban) experience. This case study supports the argument that mobile sound use can connect you to your surroundings in particular ways. The headphones of the GPS sound walk actually connect you more to the place, your surroundings and make you pay more attention instead of cutting you off and taking away your attention. When handing out 'Core Sample' to participants, Conrad would assure groups that "all the headphones are open cell. So you can hear other things going on in the background. So you'll still be able to talk to each other. Just turn the volume down" (Rueb et al., 2007, p. 1'03'08).

Something that resonates in many comments is that the piece made people feel connected to the island more strongly than without participating in the walk. One example is "We loved the walk, seeing and feeling the Island - and her spirit" [loved underlined] (Guest Book, 2007, p. 26). Another comment reads: "The islands gets an identity I'll always remember because of your interpretation" (Guest Book, 2007, p. 29). This connectedness becomes also apparent in a number of guest book comments that were concerned with the historic theme of the piece and the history of the island. One participant describes: "An aural journey of the island's history, from the present to the past. The accompanying music is hauntingly as speaks of the island's past. As if you hear a lament, but also the whisper of forgiveness and of thanks" (Guest Book, 2007, p. 7). Another participant makes a connection between the sounds of the piece and the history in the

guest book entry by stating: "I love the different sounds that all made up the listening history of this island - very creative way to my island adventures!" (Guest Book, 2007, p. 16). In the following comment it is interesting to note that the verb 'legible', a textual activity, is used to describe the listening experience around the history: "Really beautiful way to make the island's history legible" (Guest Book, 2007, p. 17).

In Core Sample; the audio content of the piece relates to the location, is site-specific. It requires local knowledge about the location to make sense of the sounds, for example you need to know what the big dig in Boston was, and that the earth went onto this island. You need to read the information signs (figure 52, page 222) on the island, go to the island visitor centre (which is quite likely because there is not much else to do on the island) and/or have pre-existing knowledge. Overall, there are different ways to appreciate the piece depending on factors such as local knowledge or the time spent with the piece.

At the same time as connecting the audience to the location and opening them to sense their surrounding in new ways, the experience is also an immersive one where the audience feels transported into another space. This comment from the guest book illustrates this: "the pleasure of being part of this experience - brought me to another time and altered space" (Guest Book, 2007, p. 8). A participant who appears to knows the artist commented: "Teri, it was like moving through another dimension" (Guest Book, 2007, p. 28). The following, longer quote from the guest book talks about getting lost in the experience, and how this contrasts with the first minutes spent trying to work out the technology behind the piece:

> It really made the mood of the whole island tour. After three hours of constant ambient noise, in fact, I'm a little sad to be without it...and a little weirded out. Odd. I usually spend twenty seconds enjoying something before I ask myself how it is done (are the tracks all random? is there just one track for every colour on the map? Will it finish playing a section before transitioning? How

> does it transition? etc.) these distractions only lasted a few minutes for me before I just got lost in the experience. (Guest Book, 2007, p. 20)

From my own experience I also recall an immersive, dream-like quality of the experience. While I was walking around Spectacle Island with 'Core Sample', sometimes I forgot about it, I was just walking along thinking about all sorts of things. At some point I lost my jacket and only when I wanted to take a picture about ten minutes later, I realised my jacket was lost, illustrating that I was quite immersed and absorbed in the experience. I had to walk back to find my jacket.

Figure 54: One of the islands paths where I lost (and found) my jacket

Overall, I recall a somehow film-like experience, a mix of daydreaming, walking, looking and listening. In the context chapter, in the section about sound art (p. 29ff.) , I argued that sonic immersion and critical distance are not exclusive. I suggest that the immersive quality of sound does not exclude critical engagement, but that it allows for a different critical engagement than some visual practices. Lefebvre's rhythmanalysis and

his attention to listening help to understand these modes and to see how they operate at the specific level of this case study. By evaluating how participants recall their immersive experience and how they also reflect critically about their experience, and the location of the piece has allowed me to argue that the seemingly contradiction between mobile headphone listening and appreciation of the soundscape is both part of the audience experience; they are immersed and connected at once.

1.6 Media Expectations

Not everybody who participated in 'Core Sample' experienced it in the more positive way as it is portrayed in the guest book, and the comments we have discussed so far. I suspect that those who did not engage with the piece that much did not bother to leave a comment in the guest book. From the interview with Rueb and Conrad we can glimpse at how some participants found it difficult to engage with the piece or even thought it was not working. Rueb recalls that one participant asked her: "Do these things do anything but play like weird, abstract sounds? (...) I mean all I hear is these abstract sounds and people talking about nothing. And is that what it is? Is that all there is?" (Rueb et al., 2007, p. 42'40). This comment frames the experience as an expectation that has not been met, a disbelief that the sounds encountered were 'all there is'.

The next comment goes even further, as Rueb recalls: "There are people who go up the north drumlin and do not hit a story along the way and they come back saying 'I didn't hear anything.' Anything? 'Well, no, we did hear crackly sounds, and fire sounds. But we didn't hear anything' " (Rueb et al., 2007, p. 41'06). And Conrad explains this situation further by adding: "I was in the background, and they were out for 45 minutes or an hour. It was really early. (...) We were still checking the maps and everything. And they said 'we can't hear anything' and I was like 'Oh my god', everything crashed?" (Rueb et al., 2007, p. 41'06). When in fact it did work perfectly well, but the participants

did not consider what they encountered 'a thing to hear'. What does it mean that for these participants the piece broke down in their view? I suggest that it is related to everyday use of mobile audio, how expectations are formed by this, and how they work for the piece, but sometimes also make it break down in the audience experience (see also section 'Moments of Breakdown' (p. 207ff.) in the chapter discussing 'Aura').

From the guest book entries (see above) we can see that one expectation several audience members had is a more narrative audio track. This expectation stems from previous encounters with mobile audio media such as museums guides. In these one (or several) voice(s) provide additional information about a specific location or piece in the museum (or ruin, etc.), and produce a narrative around this additional information layer. This audio information is usually triggered in specific locations and/or by the audience pressing buttons on their audio device. 'Core Sample' does feature some snippets of interviews and engages with information about the location, but in much less narrative and more abstract way than a museum guide, thus challenging these audience expectations.

The second 'mobile audio' experience the audience can draw on (and thus include in their expectations) is Walkman or iPod listening, where people (mainly) listen to music of their choice in a (more or less) continuous stream. 'Core Sample' also has a continuos stream of sound, and at times the experience might be similar to the film-music like way we listen to music on iPods.[141] However, the sounds are not audience-chosen music but

141.'Core Sample' features continuous sound, giving you the impression that the entire island is covered in various sound sections; making this different to the artist's earlier work. Rueb's first GPS piece 'Trace' was located on the hiking trails surrounding the Banff Centre in the Canadian Rocky Mountains. Rueb explains: "Trace had a lot more air in the composition [than 'Core Sample']. This was a specific concern to let people also just be with the ambient soundscape, the natural soundscape or existing soundscape. Also I wanted to allow them to be with their own thoughts for the majority of the time." (Rueb et al., 2007:35'50). Another of her GPS sound walks, 'drift', was exhibited in Cuxhaven (Germany) in 2004 where it was part of the exhibition 'Ohne Schnur' (curated by Katja Kwastek); this where I first met the artist and participated in the sound walk. I remember there were vast stretches without any sound at all and only very small pockets with sound. All sounds were moving in and out with the tides (Rueb, 2004).

more abstract sounds curated by the artist. The piece builds on these two well-known ways of mobile audio experiences, audio guides and iPod listening. But as we can see from Conrad's comments on how he had to explain the piece, for some people these expectations of a (more narrative) audio guide or of a mobile music experience were not met, and the piece was perceived as 'not working'.

More recent mobile media phenomena such as geo-cashing[142] are also familiar (though non-audio) practices some audience members were able to draw on. One guest book entry reads: "I thought geo-caching was the epitome of the tech plus nature, but this really topped that. Thank you for your fabulous creativity! Your art rocks. :)" (Guest Book, 2007:19). Conrad commented on the geo-cashing visitors in the interview:

> The people that do geo-cashing stayed out for three or three and a half hours. They came back and they wish they'd have time to go out longer and they barely made the last boat. [Rueb:] Their comment was interesting because they were saying that usually they were pre-occupied with how the thing works but in this instance they were able to just move with it into a different space, past that concern. It was interesting. That is the kind of thing that we as a community of makers understand as a kind of distinction, as a fine aesthetic distinction. (Rueb et al., 2007:46'23)

This section of the chapter has examined the audience experience of participating in 'Core Sample' by drawing on guest book entries, my own experience and an interview with the artists. The material has been analysed through Lefebvre's concept of rhythmanalysis, working with his different types of rhythms to discuss how both the soundscape and the sound art layer have been attended to by the audience, and also how the audio-visual perception has been altered. The section has then integrated this concept in a broader discussion of immersion and feeling connected to the site, and the relation between the art experience and everyday mobile sound experiences.

142.For geo-cashing a 'treasure box' (e.g. a plastic box with a logbook and trinkets) is hidden in the outdoors. The GPS data of its position is published on a relevant website. Other people can then find this location and discover the exact place where it is hidden, adding their names to the logbook (Dyer, 2004).

2. Rhythmanalysis as Artistic Methodology: The Making of 'Core Sample'

This second section of the chapter shifts from the audience experience to the process of the artist making the piece. I suggest that the artist, like Lefebvre, is exploring the landscape through rhythmanalysis and is building the piece by translating rhythms into sounds that are then distributed in space. I propose that Rueb is in particular exploring three kinds of rhythms that are later translated into sounds: the existing soundscape, voice from the past, and satellites. These part of this section discusses how this translation into sound works and how they are mapped onto the geography of the island.

2.1 Results of Rhythmanalysis: Artworks as Sensory Crisis

In terms of capturing rhythms, Lefebvre has a similar argument to De Certeau (Certeau, 1984, p. 35), in that visual ways of documentation do not work: "No camera, no image or series of images can show these rhythms" (Lefebvre, 2004, p. 36). Instead he suggests to use "eyes" and "ears", "memory" and "heart" but this still does not talk about the way these captured moments are presented to the audience of the rhythmanalyst: Lefebvre assumes, but never is explicit about this, that the product is writing (2004, p. 36).

Lefebvre compares the mode of attention of the rhythmanalyst to the one of the psychoanalyst (Lefebvre, 2004, p. 19); later on he claims the rhythmanalyst is closer to the poet (p. 23). Both professions are about words, and so is Lefebvre himself as theorist, as 'poeticist' of space. I aim to extend Lefebvre's textual concept of how to capture the results of rhythmanalysis and his call for a post-disciplinary approach (Lefebvre, 2004, p. 36).

Lefebvre claims that "[a]rt, poetry, music and theatre have always brought something (but what?) to the everyday. They haven't reflected on it. The creator descended to

the streets of the city-state; the portrayed inhabitants lived among the citizens. They assume the city life" (Lefebvre, 2004, p. 25). Why should non-textual modes of capturing the attention to rhythms - such as the arts - be less reflective? Rhythmanalysis points to similar modes of experience as those on the arts, multi-sensory and embodied ones, and reflection on these does not need to be verbal, there can also be artistic, sensory, embodied ways of reflection.

Despite questioning the reflexivity of the arts, Lefebvre is hoping the theorist could bring back something to the city in a similar way the artist does: "The rhythmanalyst could, in the long term, attempt something analogous, works [oeuvres] might return to and intervene in the everyday" (Lefebvre, 2004, p. 25). The idea of having rhythms feeding back into everyday life is a political one, and one that is very much connected to arguments about art, and especially public art.[143]

The idea of intervening in the rhythms of everyday life is also discussed as "moments of crisis" (Elden 2004:x) and the theorist gives car accident as example for these interventions:

> The rhythmanalyst has to reach such a rhythm without putting himself in a pathological situation, and without putting that which he observes there either. How? In the street, a cry, a screeching of breaks, an accident makes confused rhythms sensible and breaks them up. Yet the rhythmanalyst does not have the right to provoke an accident. He must simultaneously catch a rhythm and perceive it within the whole, in the same way as non-analysts, people, perceive it. (Lefebvre, 2004, p. 21)

I argue that those moments of "breaking up" rhythms could also be artworks. Where the theorist might not have the right to "provoke an accident", the artist might have the right to provoke a crisis of the senses with his or her artwork. The following section of this

143. See section 'Public and Dialogical Art' (p. 40ff.).

chapter is one long argument for this case, using the theoretical framework as discussed in this section to analyse the case study of an art work.

2.2 Listening to 'the Vibe of the Place'

When Rueb first visited the location for 'Core Sample',[144] she was struck by how "this landscape bears very little trace" of the history of the place as it is presented in the visitor's centre where "you see these stories you can't believe, one layer after the next" (Rueb et al., 2007:26'00). The artist considers the signage (figure 52, page 222) on the island "very well done" and "not trying to sugar coat the past" (Rueb et al., 2007:26'00). Rueb describes how she was attending to the island, listening to the soundscape, engaging via walking, in the process of developing 'Core Sample':

> I chose Spectacle in July 2006 and then was researching it and making the proposal. When it was finalised I only had six weeks or so to get out there before the winter. So all that period was walking, and calibrating. And in the spring the ferry starts again. (...) I think *we spent almost all of that time walking, listening to the soundscape*, the natural, ambient sound of the island. Natural, I don't know if that is the right word for it. You know, the planes droning are a dominant feature of the soundscape.[145] (...) I wanted to embrace rather than try to mask or deny the whole industrial landscape of it. *I need to understand what is the feeling or the vibe of the place first through experiencing it, walking it.* (Rueb et al., 2007:27'14) [My emphasis]

The artist decided early on that she wanted to "evoke the sense of what is underneath that you can't see from the surface" (Rueb et al., 2007:27'14). This attention to the sounds, layers and resonance of a location, as discovered by listening connects to Lefebvre's argument that listening is a key methodology of rhythmanalysis, as discussed earlier. Rueb's description reminds me of Lefebvre's arguably most famous section of *Rhythmanalysis*, the one describing the rhythms of Paris as perceived from his window. The title "*Seen* from the window" (Lefebvre, 2004, p. 17) [my emphasis] is an interesting

144. The artist could only access Spectacle Island after it opened to the public in late June 2006 "after years of it being off limits for being toxic" (Rueb et al., 2007:25'20).

145. The airport is less than a mile away from the island.

choice for a chapter that is primarily concerned with listening. The author introduces his mode and position for listening first:

> Noise. Noises. Murmurs. When lives are lived and hence mixed together they distinguish themselves badly from one another. Noise, chaotic, has no rhythm. However, the attentive ear begins to separate out, to distinguish the sources, to bring them back together by perceiving interactions. (...)
>
> In order to grasp this fleeting object, which is not exactly an object, it is therefore necessary to situate oneself simultaneously inside and outside. A balcony does the job admirably. In relation to the street, and it is to this putting into perspective (of the street) that we owe the marvellous invention of balconies, and that of the terrace from which one dominates the road and passers-by. (...)
>
> From the window opening onto rue R. facing the famous P. Centre, there is no need to lean much to see into the distance. (...)
>
> He who walks down the street, over there, is immersed in the multiplicity of noises, murmurs, rhythms (including those of the body, but does he pay attention, except at the moment of crossing the street, when he has to calculate roughly the number of his steps?). By contrast, from the window, the noises distinguish themselves. The flows separate out, rhythms respond to one another. (Lefebvre, 2004, p. 27)

Lefebvre is listening to a very different soundscape in Paris, downtown, and at a different time, than Rueb. But even though the site of the piece is an island it is still an urban, industrial one. It is the way the theorist Lefebvre and the artist Rueb listen that strike me as having a similar sensibility. What is different about Lefebvre's description is that he is immobile and in private when listening to public sounds - as opposed to walking in the streets amongst the sound. Lefebvre chooses to listen from above, from a balcony. If we bring together Lefebvre's auditory sensibility with De Certeau's attention to the embodied mobility of walking we can focus on walking in the midst of urban rhythms. I argue that the rhythm of walking itself needs to be embodied, not observed. Understanding mobile media experiences, mobile media art, requires a walking, a mobile body, as a methodology. We will return the the role of walking for both the artist and the audience later on in this chapter (see section 'Walking Rhythms', p. 256ff.). After examining the way the artist is listening to the existing soundscape of the island, to the more contem-

porary rhythms by walking the island, we now turn to the way the artist aimed to uncover past rhythms of the island, by listening to voices of the past.

2.3 Voices from the Past

In 'Core Sample', some rhythms of the past are represented by voices from interviews with people who lived or worked on the island. This is reminiscent of audio guides in museums where information about locations is increasingly presented from a more personal point of view, in form of interviews or made up characters that explain historic events from their perspective. 'Core Sample' is not one of those guides and is not a oral history, but builds on some of these traditions, interpreting them in an artistic way. For the main part, the piece consists of more abstract sounds, but it also contains a number of fragments from interviews with former residents of the island or experts on it. Rueb clarifies: "I knew I wasn't going to do an oral history proper, but I knew I wanted to talk to people and however that would filter into the work I didn't know" (Rueb et al., 2007:27'14). Initially the interviews were part of the research process for developing the piece. Only at a later stage they became part of the actual piece and its sounds: "laying in the actual voices was actually a very late, late, late stage decision" (Rueb et al., 2007:23'10). Rueb explains why she is using fragments of interview while not aiming to make an oral history of the island:

> I was hesitant. Because I didn't want it to fall into the category of a kind of documentary or attempt to resuscitate ... a history that was anchored in a very specific way. Also, because to really do that properly you would need to meet and know, a whole different network of people, not just the people working in the industry, but also Native Americans. How do you determine when to stop? I'm not an oral historian, it's not my purpose. *But what ultimately emerged was a theme around margin and edge and outcast.* And so to the extent that those stories can evoke that theme in the end I felt it was necessary to include them. And it's a narrow sample of the stories that were collected. And it's also a narrow sample of the people I spoke to. (Rueb et al., 2007:33'36) [My emphasis]

Rueb explains who her interviewees were:

> I included four interviews in the final piece. There is Peter Del Tredici, the horticulturist, Niall Kirkwood, the landfill technology expert, Ken and Jenny Hollingswoth, as well, that grew up on the island. Jenny's is not included as her voice at all. It's more like a section of sounds. Her story is inspired more as a sound tracing (...) a whole sequence of rowing you would hear, on the edge (map) of the island. (Rueb et al., 2007:17'00)

For the artist it is important that Spectacle Island has different meanings, and especially ones that might seem surprising given that it served as a dump for such a long time:

> But it is also a dearly loved island. It means a lot of different things to many different people. And the former residents, for the most part describe it as a idyllic landscape. There was always the dump. You heard that edge quality in the landfill section. That was not considered the island. That was just known as 'the other side' where the trash went. Residents lived on 'The island'. (Rueb et al., 2007:24'09)

Rueb did not take the interviewees out to the island "to approve it" but she was relieved when they were all quite happy with the resulting piece as the artist feels very strongly about the relationship of the voices and the island and her role in the process: "They are actually the people who have the first relationship to this place. I come as an interpreter with my own relationship to it. (...) And then edit those voices which ultimately kind of conform to your interpretation (...) this is really a complicated issue in site-specific work" (Rueb et al., 2007:1'15'47).

In addition to this more recent history of the island that the artist tried to uncover via interviews, the more distant rhythms such as the Native American history of the place have not been as prominent. The artist makes two connections between Spectacle Island and the Native Americans who once lived there: one is a reference to a historic landfill by Native Americans, and the second is one is that the location of a genocide is visible from the east-facing side of the island:

> Their [Native Americans] voices aren't there proper. (...) I doubt that they feel adequately represented. (...) I saw the Native American habitation almost as a pre-history. It's inaccessible in so many ways. (...) Their own landfill was a much more eco-friendly one, a shell midden. (...) From the point of that

> archaeological site, you can look over and see Deer Island. There is not a Native American in New England, I'm sure, who looks at Deer Island without knowing what happened there, a genocide of the local tribe. (Rueb et al., 2007:01'15'47)

There was a critical voice concerning the representation of this specific 'rhythm' in the Guest Book, asking "But what of voices/traces of Native Americans, here c.1000 years?" (Guest Book, 2007:19). It seems like the longer ago, the more faint rhythms become, and the more difficult they are to capture. But there is of course also a political dimension to to what kinds of histories can be easily 'heard' and which ones have been silenced. 'Core Sample's relation to Native American history is problematic, as its reading of this island's history seems to be be in tune with the dominant rhythms of official US American history: The silenced voices of Native Americans are difficult to hear, both in contemporary society and in this GPS sound walk. A different attention to the politics of memories and contested historical narratives (Walkowitz, 2009) could allow a deeper engagement with these historic rhythms. Native Americans are still disappearing in American history, the conflicting rhythms of displacement and disengagement resonating still today. Overall, this section has outlined the challenges the artist faced in exploring the many layers of histories and memories of this landscape.

2.4 Satellite Rhythms

Another rhythms the artist is attuned to is the rhythm of the GPS satellites circling the earth. The sounds of 'Core Sample' are played back depending on the position of the participant which is read by the built-in GPS of the PDAs (figure 48, page 218) carried by the audience. Built-in GPS units are not as robust as stand-alone devices (as they do not hold as many satellite fixes) but still, Rueb and Conrad were both surprised that they needed to test more than 15 PDAs with built-in GPS to find ones that were reading consistent enough to be used in the installation (Rueb et al., 2007:1'10'11). They were also surprised to find that they had GPS reception problems on Spectacle Island, especially

concerning "the fact that there is an airport nearby" (Rueb et al., 2007:01'23'14), as Conrad further elaborates:

> It might just be a software issue but the thing that is really strange about Spectacle Island is that you would think they would have amazing coverage because there is no urban canyon, it's very populated, it's not in the middle of nowhere, it's part of Boston. [Rueb:] there is no impeded view to the sky anywhere on the island. (...) Here, south, you would get ten or twelve satellites, consistently. As you move up here [pointing at the map] maybe eight, and over here, there are certain parts here you can only get three or four which is barely, if you drop one, with bad weather or something else, you are without signal. [Rueb:] Or it is jumping radically. [Conrad:] But you can get six over here. But it is really weird that in this island that is not very big and there is no GPS-wise occlusion in the sky, most of the satellites you can see from Spectacle Island, even with my handheld GPS, are to the south, either straight overhead or to the south, so there is weird south bias in terms of not having coverage on one side. (Rueb et al., 2007:01'21'47)

GPS (Global Positioning System) has been developed by the US military and has been operational since 1995. It also widely used commercially with one of the most common use at present being satellite navigation ('sat nav') systems in cars. Increasingly, mobile phones also have built-in GPS units (making location-based mobile services more likely to proliferate than with its earlier reliance on cell phone mast triangulation). GPS is commonly assumed to be precise and to work anytime and anywhere. This is not the case, as the GPS unit needs to connect to a number of those satellites orbiting the earth to calculate an exact position.[146] There are 24 to 36 satellites orbiting the earth. Four control centres on earth coordinate them. The millions of GPS receivers in planes, boats, mobile phones, cars, etc. receive the signals that are continuously sent out by each satellites and can then calculate longitude, latitude and altitude of the receiving device. Four or more of these satellite signals are needed to calculate a position.

Obstructions such as dense urban areas or high-rise buildings create so-called 'urban canyons' where GPS reception is difficult. Ironically enough the marketing of location-

146. The added time error that made the commercial signal less accurate than the military one was switched off in 2000.

based mobile phone services typically advertise urban services that are most likely to suffer from this condition. Roads for cars are often wider, and cars tend to be more in the middle of them than pedestrians, often giving 'sat navs' better reception than pedestrian mobile media. It is interesting to note that different urban geographies, for example a mediaeval Italian town centre or a sprawling American suburb result in different precision of GPS reception. 'Spectacle Island', the location of 'Core Sample' would be unlikely to suffer from any GPS reception problems. However, as Conrad explains:

> It does say something about the idea of Global Positioning Satellite System, that not just the places that engineering wise seem to be complicated like urban canyons (...) but Spectacle Island there is no reason why you should not have satellite coverage. Military grid, you probably can bomb Spectacle Island (Rueb: with a degree of centimetre precision) but for commercial grade it still has problems. (Rueb et al., 2007:01'23'14)

For the most part, the use of GPS in this piece is not obvious to the participant. As mentioned earlier, the participants walk around the island with a small PDA computer produced by HP, (ipaq) in a pouch that you can hang around your neck. Open cell headphones are connected to the PDA and there is a volume control to adjust the sound. The sounds the participants hear are triggered by their location as determined via the GPS. But because most people associate GPS positioning with points and lines on screen-based maps - and the participants cannot see these - they only have headphones - they are not really aware of the GPS technology. A reference to GPS is however present in the sounds of 'Core Sample', as Rueb points out:

> The atmospheric layer of the Core Sample is meant to extrapolate up into the atmosphere and the sounds that you hear, a lot of people think they are crickets up there but they are actually radio astronomy sounds, whistlers and choruses, among other things like birds and thunder, etc. That was meant to kind of evoke the recognition that there is a telesphere too, that there is actually a link across these different ecospheres in a sense. (Rueb et al., 2007:1'18'30)

This quote illustrates how the artist is attuned not only to the current rhythms and the existing soundscape of the island, and to rhythms of the past (interviews), but also the

the 'mechanic' rhythms of the satellites that enable the location of each participant on the island to be detected.[147] GPS can be understood as a classic De Certeau control grid, a strategic technology.[148] However, the experience of such as control grid depends on how you are forced to use it and how you choose to use it. In 'Core Sample, you are under a gridded sky but you are not acting like that, the piece is concerned with embedded experience where you move through a place which has a kind of gestural map that you have to find, feel and experience in the landscape. The artist translates the awareness of these rhythms into sounds, and these are mapped onto specific locations. This process of translation of rhythms into sound and layering onto the landscape is discussed further in the following section.

2.5 Rhythms, Sounds, Geographies

The close attention to the rhythms, geography and sounds of the site are translated into the sounds and the distribution of the sounds, and those are then experienced by the audience, as discussed earlier in this chapter. As can be seen in the exhibition guide (figure 49, page 219), the different themes of sounds are: "Atmosphere, plantings, top soil/loam, central artery fill, modern landfill, settlement and industry 17th-21st century, native american landfill 500-1580, geologic core." Each of these themes has different sounds and different fragments of interviews associated with it: field recordings, found sounds, electronically filtered and raw sounds, musical passages, recorded histories of residents and workers. One could suggest that Rueb works like a sonic and spatial poet, e.g. condensing a story into rowing sounds (see p.247) and placing narrative vignettes in specific locations.

147. Rueb's concern with the rhythm of GPS satellites is shared by many other artists working with this technology (see (see Harris, 2007 amongst others), amongst others).

148. Also see the earlier discussion in the section ' Locative Art ' (p. 15ff.).

One example sound illustrated how one specific sound chosen by the artist represents different rhythms and relates to the site in various ways: The sound of 'snoring' was referenced frequently in the guest book entries, and I remember it as well from my own walk. One participant made the effort of composing a rhyme around the piece and snoring :"A Man's snore - Islands core - All in store - Electronic tour- has not a bore." (Guest Book, 2007:3). Another entry reads: "Was there a man snoring...? Very neat!!" (Guest Book, 2007:1) The snoring references dormancy, one of the key themes of the piece, as Rueb explains:

> The snoring was inspired by the Rip van Winkle folk tale. It's an American story about a character who falls asleep for a hundred years and wakes up and his beard is really long (...) Peter Del Tredici [horticulturalist in interview] describes the island as being kind of like Rip van Winkle. When he first came it was really shaqry and scabbly and polluted (...) I also brought the snoring into the piece based on the experience I had out there last fall when we went out on the trail and there was this sense of a kind of *dormancy* about it. One of the landfill experts, Niall Kirkwood, describes the island as a volcano, likening landfills to volcanos. There is a lot of energy boiling *underneath the surface* of landfills that can be captured and reclaimed and made into usable energy. The snoring is more the psychological, relating to the outcast condition (...) Peter del Terdici described the island as a kind of derelict that he picked up from the streets, cleaned it up, shaved it, put it into a suit, returned it to society as a productive citizen. I love that image, too. My own image is more that of an *embalmed corpse*. To me I see it as a really *distressed landscape that has been made to look as if it is peacefully sleeping*. (Rueb et al., 2007:18'40) [my emphasis]

The 'dormant' rhythms of this "corpse" the artist is exploring are resonant of Lefebvre's 'secret rhythms', as discussed earlier (see p.230). All the audience hears of the artist's process of rhythmanalysis is the sound of 'snoring' in several locations on this island. 'Snoring' is one example of the links the artists made between the landscape, and the sounds we hear in the piece.

After translating the various rhythms of the island into sounds, they are mapped onto the geography of the site. Each of the themes (see p.251) is associated with a certain elevation level on the island. As you walk up and down hills, you transition

between these themes and their sounds. The artist describes this working with a landscape rather than with a canvas or a screen as follows: "An island presented a very interesting canvas, it was this contained thing, it was framed, and as a topography, it had this structure with the path system that people stick to because you are told constantly not to go off the path system. I planted a couple of things for those who did" (Rueb et al., 2007:33'36).

From my own experience I recall that I found it quite frustrating that you cannot walk between the paths as everything else is covered in brambles and poison ivy; it is impossible to walk up to the summit of the drumlins in a straight line, you have to walk up following the ascending circles of the path system.

> It was really obvious that the path system itself had this natural kind of contour, an elevation contour quality to it. It seemed like the appropriate mapping for the core. It became this really interesting compositional structure where things can transition, with the spiralling up or down of the path. (Rueb et al., 2007:33'36)

Rueb gives some examples how the locations and the sound relationship is articulated, on the north drumlin "you hear this discussion about the plants and then a discussion about this kind of vista you would have seen from the top, looking at the Boston skyline" and on the other hill "the sounds are inspired by the story of a former resident who used to watch the submarines and ships coming in and out of the harbour during WWII" (Rueb et al., 2007:33'36).

After recalling my own 'Core Sample' experience in the interview with Rueb, she explains the different sounds and locations I encountered, and thereby sums up the rhythm-sound-location relation of one participant experience. She explains my own walk and its sounds and locations as she goes along:

> You [Frauke] went a route with mostly pretty abstract textural sounds. (...) The textual sounds are like background information before the story starts. It's [south drumlin] got a different, somewhat parallel character to the north drumlin but it has more voices. There is a voice that is pretty key. (...) On the

> south drumlin there is also a sound passage by a fellow who has studied the horticulture of Spectacle Islands for 15 years now. Did you go trough the landfill part? The saddle in the middle. So you heard the textured sounds in the middle? (...) There is a gazebo there, a hut, a shelter, that has the voice of Niall Kirkwood who is a landfill expert. And then there are stories on the south drumlin that are from former residents. Kate Rivera tells stories from her childhood. (...) And also on top of the south drumlin are atmospheric sounds, radio astronomy whistlers and choruses. (Rueb et al., 2007:09'00-14'13)

The participant's path through the island articulates the media geography in relation to the topography of the landscape, evoking and performing the location's, the piece's and the participant's rhythms via sound.

2.6 Screens and Walking

Returning to the earlier argument by Lefebvre how visual forms of capturing are difficult for documenting rhythmanalysis (see p.242), it is interesting to examine the visual interface of the software used in the production of 'Core Sample', and how it is at odds with the need to get away from the screen, to walk in the actual locations.

There are not many off-the-shelf application for geo-annotation, and most artists (including Rueb) have been developing their own custom hard- and software solutions, and many continue to do so. The off-the shelf software used for 'Core Sample' is called mscapes and is developed by Hewlett-Packard (figure 55, page 255).[149] The results are called 'mediascapes'. The HP lab aimed to develop an easy to use software with a WYSIWYG desktop metaphor - as will become apparent later, the reality "on the ground" is a bit more messy than the website[150] suggests.

149.HP has the financial and marketing power to promote this platform and invite content. They collaborate with well-known institutions and names. In December 2007 HP organised an event called 'mscapeFest 2007' around this software and Rueb was one of the invited keynote speakers (Packard, n.d.). Rueb is also a "Featured Mediascaper" on their homepage (Packard, n.d.).

150.The mscapes homepage explains: "1. Download the mscape software to your Windows PC. 2. Connect your mobile device to your PC and use the mscape library to copy the player and the starter mediascape onto it. 3. Start the mscape player and load the starter mediascape. 4. Go outside and play! You will need a clear view of the sky so your device can get a stable GPS location fix." (Packard, n.d.)

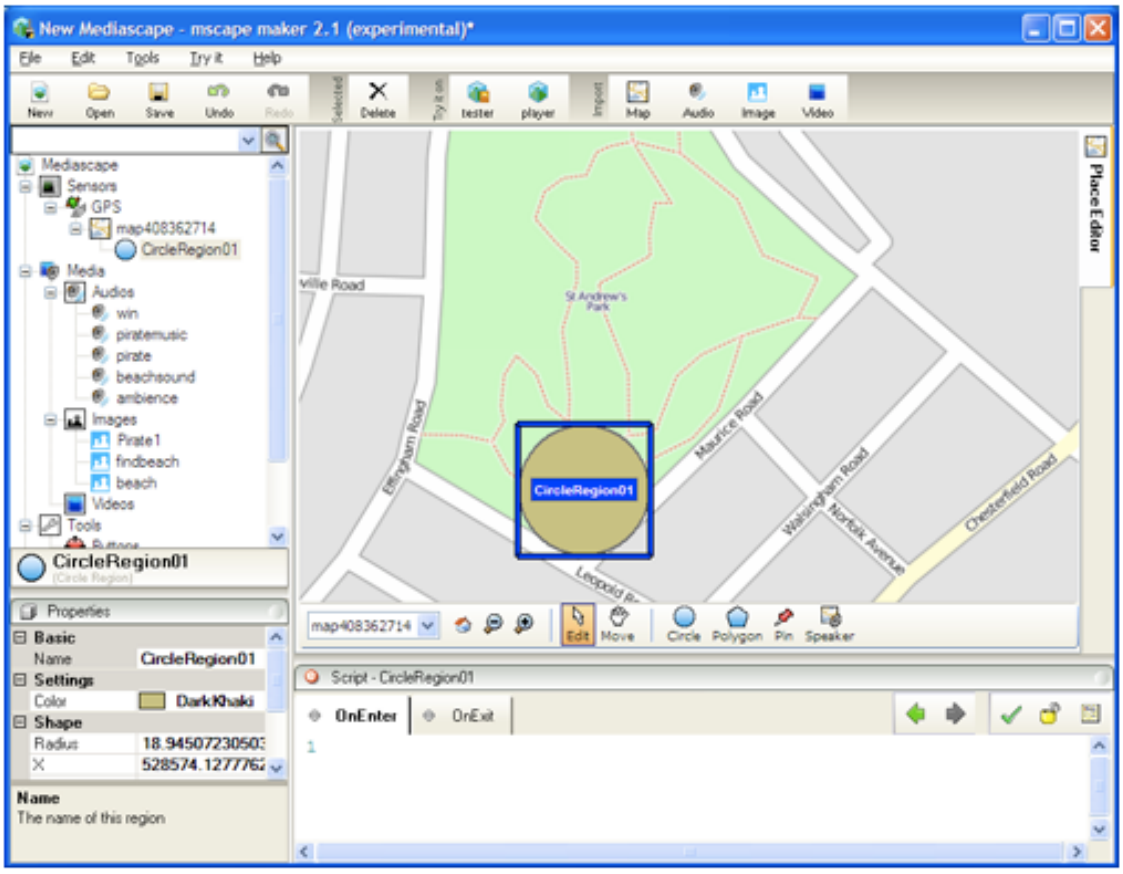


Figure 55: Screenshot of the mscape software where you can 'author' media areas on an imported map. The finished version is then loaded onto mobile devices for experiencing the media 'in situ'

In the interview, Rueb stresses that the reality of making 'Core Sample' was not as straightforward as the mscapes website might suggest: "They are not just like this is a zone, this circle will play, and I'll play one thing and then you go 200 yards and then you'll hear another thing and you'll hear one single sound. It ['Core Sample'] was a much more involved composition" (Rueb et al., 2007:1"10'11). The visual interface of the mscape software suggest an ease of use, it implies that you can develop from your chair in front of a screen. For pieces that work with very detailed positioning, such as 'Core Sample' this is not the case. The developer needs to work in the actual location. On Spectacle Island, some of the paths are very close to each other as they wind up the hills (if seen from above, form a GPS satellite, or on a 2-D map). Therefore precision for placing the sounds was key. Rueb explains that it was in fact a long and painful pro-

cess to work out the details, and the process involves a lot of walking in the actual location: "The only the way to really get it right is to walk, walk, walk, walk, walk" (Rueb et al., 2007:01'08'38). She also talks about the miniscule adjustments, the many iterations, and indeed the amount of walking that were needed for the piece:

> One of the most mundane [aspects] is just trying to refine the dimensions of the regions and their relationships to each other, around measures of one or two feet. Not that everything is that precise, but you want to know that a person walking on the edge of the path on the right-hand side is going to hear the sound you want them to hear. But there needs to be a little bit of bleed, a little bit of margin off the path but not too much, because it could bleed into the next path. Because it's on a slope too. (...) I can't even tell you the amount of refinement. Just like revision and revision and revision of where this little line is. (Rueb et al., 2007:1'07'08)

Analysing the more technical side of the piece, with its relationship to GPS and the visual editor has revealed how developing for mobile media and sound requires a deep engagement with the technology in the actual location, not on screen.

3. Walking Rhythms

Walking is key to both making and experiencing 'Core Sample'. The making process of 'Core Sample' is bound up with walking in several ways. To get to know the location a long time was spent walking. But also in the later stages of editing the locations of the sounds was very much bound up with walking as Rueb explains: "Ultimately you have to walk. You have to physically feel and hear the sound in the place that it was placed. And the scale of each sound and how it transitions to the next one and they layer and how they sound in different sequences" (Rueb et al., 2007, p. 31'20). This is a very different experience than sitting at home at your computer and editing. Conrad highlights just how many times they walked the trails in his exaggeration: "We walked the trails a billion times" (Rueb et al., 2007, p. 41'06).

Walking is also key for the audience experience. You need to explore the island by walking to experience the different sounds. There are a number of audience comments that mention walking and the mobility of the experience in general, sometimes in relation to the sounds. One example from the guest book is: "I really enjoyed the sound (music, waves, etc.). It took the drudgery out of the hike. The voices and Benny Goodman at the end of the trail (dock) made me feel that I was returning to the city. It was all worth the climb to the top" (Guest Book, 2007, p. 14). This comment indicates that the sounds can work as a kind of treat for walking. This is also reflected in a comment by a family: "A great way to keep 10yr olds walking... Thank you!" (Guest Book, 2007, p. 10). Another entry in the guest book indicates a tension between having to walk, and the "effortlessness" of the experience: "it's great to be able to experience art like this, effortless, intuitive" (Guest Book, 2007, p. 10). This might indicate that 'Core Sample' takes away the focus from the actual walking and makes the participants focus on different aspects of the walk by means of sound. Others appreciated the pace this installation permits: "Beautiful use of technology to allow us to move at our own pace" (Guest Book, 2007, p. 16).

Participants make their own version of the piece by walking, each person walks a personal version of the paths, and in the artist's comments and from my own experience it becomes clear that even if you are aware of this fact, there is still room for surprise:

> You can't ever know what people will do in what order. For example, the walk you did, I can't imagine ever, I don't think in all the times, I don't think I ever did that sequence. That seems to me... Anything people do is valid, but I would never have walked that way. (...) I assumed that most people would be making a straight line to the summit as fast as they can. (Rueb et al., 2007, p. 31'20)[151]

151.I walked along the coast line first, and then up one of the drumlins.

I defined the remixing function of the audiences trajectory as a key feature of the 'Placed Sound' category of my taxonomy of mobile sound art (see p. 49 ff.). De Certeau's embodied understanding of walking[152] and Lefebvre's of multi-sensory knowing as developed in *Rhythmanalysis*, allows us to understand walking as more than 'remixing', it is also a way of knowing. As Rueb stated earlier: "I need to understand what is the feeling or the vibe of the place first through experiencing it, walking it" (Rueb et al., 2007:27'14). In mobile media art, the rhythm of walking could be regarded as the one rhythm that relates to all the other ones, the rhythm that allows us to know the piece, the landscape, the media, at once.

4. Conclusion

This chapter took Henri Lefebvre on a GPS sound walk to explore how the artistic production of *Placed Sounds* as well as their consumption can be understood as an engagement with various rhythms. The first section of the chapter unwrapped the bundle of rhythms the audience is experiencing when participating in 'Core Sample'. After introducing the site and the audience of 'Core Sample', I used Lefebvre's concept of rhythmanalysis to analyse guest book entries by the audience. His multi-sensory approach combined with a focus on temporal allowed me to understand the experience of 'Core Sample' as an artistic "mediation on time, the city, people" (2004, pp. 28-30). I discussed the intertwining of linear time (GPS) and organic time (walking bodies) in the performance of the audience trajectory, as well as exploring how secret rhythms, rhythms of the past are becoming 'audible' for the audience.

The auditory and audio-visual attention of the audience is evidenced in the guest book entries, where moments of synchronicity of sensory events, a dialogue of the phys-

152. See chapter 'Polyphonies of Footsteps' (p. 186ff.).

ical landscape and the auditory landscape is frequently referenced. Many participants also reported a feeling of strong connection to the island, the audience is listening to both the sounds on the headphones and the soundscape of the island. They are immersed in the sounds but critically reflect upon their engagement with the landscape: connected and immersed at once. These audience experiences of 'Core Sample' are discussed in the light of everyday media practices the audience was drawing on in framing their experience of the piece.

The second part of this chapter switched the perspective from the audience 'consumption' to the artistic 'production' and discussed the concept of rhythmanalysis as artistic methodology. I argued that Lefebvre's engagement of the body and the ears is at odds with his insistence on a written outcome of rhythmanalysis and suggest that art can also be an outcome, understanding artworks as provoking moments of sensory crisis. I illustrated this by discussing how the artist is listening to "the vibe of the place through experiencing it, walking it" (Rueb et al., 2007:27'14) and pays attention to the various rhythms of the landscape and its past, and how this is resonating with Lefebvre's mode of listening to the city. I then showed how the artist translates historic rhythms into 'voices' of the past (interviews, sounds, recordings), making secret rhythms 'speak' of histories, while others remaining problematically silent. I also pointed out how the linear time of satellite rhythms is at the heart of the way the piece functions; the GPS position of the audience triggers specific sounds. While this technical rhythm is not felt or experienced as such by the audience, the artist engaged with the idiosyncrasies of the GPS rhythms at length in the technical production of the piece.

Walking - as opposed to the immobile (and screen-based) engagement we often associate with networked media and maps - has turned out to be a key activity in exploring, producing, and consuming the rhythms of the island and the artwork, as discussed

in the third part of this chapter. Lefebvre's focus on the body as the "point of contact" between social and biological rhythms", as Elden summarises (2004: p pxii), allowed me to understand walking as a way of producing embodied, multi-sensory knowledge.

Overall, this chapter has unwrapped the bundle of rhythms both of the audience experience and of the artistic production. The media geography of the piece, the relationship between sound and topography is articulated in the location of sounds that are experienced through the trajectory of the listener. 'Core Sample' is an example of rhythmanalysis where walking and listening bodies experience "rhythm: the music of the city" (Lefebvre, 2004, p. 36).

VIII. Conclusion

Almost a decade after I experienced Levin's 'Telesymphony' and first started to wonder about the ways mobile media might enable music and sound art to spill out of arts institutions into our cities, mobile phones are networked and sensor-studded computers (not monophonic, monochrome 'bricks'). The popularity of mobile music has driven much of this development (remember, the iPod was only introduced after 'Telesynphony') and in later years of my detailed research into the field, increasing numbers of mobile media art works have been produced and have explored sonic interactions with urban spaces.

In this conclusion, I point out the relationships that emerge through the case studies and bring together some of the discussions of the earlier chapters. To do this I briefly revisit key themes set out in introductory chapters - hybrid spaces, sound studies and (sound, mobile, public) art as experimental space - and return to the questions that guided this research of mobile sound art.

1. Thesis Summary

In this thesis I set out to explore the sound-mobility relation by researching mobile sound art with a focus on the embodied experience. To initiate a discussion of the findings of this thesis, I outline key points from each chapter.

The first chapter, 'Approaches to Locative, Sound and Public Art' (p. 15ff.), located mobile sound art in the fields of locative art, sound art, and (communicative) public art. The locative art discourse is a mainly visual, cartographic and technological one but provided a relevant framework for discussing the role of the audience, especially the importance of the experience in-situ, the concept of walking as remixing and the frequent hope of using 'new media' to access 'new' audiences. I argued that a shift of focus

from 'locative' to 'mobile art' allows us to appreciate temporal and multi-sensory aspects. The discourse around sound art enabled me to discuss the role of sound in spatial perception, immersion and interaction in order to access how they operate for audiences of mobile sound art. The public context of mobile sound art was critically discussed in the light of the (new genre) public art concept of 'dialogical art'. This section asked how art operates in everyday settings, and how claims of audience transformation and meaningful interactions with public space translate for the mobile context. Drawing on these three frameworks, this first chapter explained how the audience interaction operates and co-produces works of mobile sound art.

In light of these relevant discourses, and drawing on my archive of mobile sound art I developed 'A Taxonomy of Mobile Sound Art' (p. 48ff.) with four categories in my second chapter. The category 'Placed Sounds' was defined as the artist(s) placing sounds (abstract sounds, fictional or historic narratives) in public spaces - the audience's trajectories through this space (by walking or driving for example) then make individual spatial-temporal 'remixes' of these sounds. 'Sound Platforms' (p. 57ff.) are designed by the artists and allow the audience to place their own sounds in public spaces, and the collaborative result can be experienced in similar ways to the first category. Curating the audience engagement and their contributions (with events or workshops, for example) was identified as crucial. The third category, 'Sonified Mobility ' (p. 66ff.), was concerned with turning the mobility of the audience (a GPS data stream of a walk for example) into sounds, shifting the focus from linked locations to the trajectory of the audience body itself. 'Musical Instruments ' (p. 72ff.), the last category, was defined as turning popular mobile media, especially mobile phones, into musical instruments in a variety of ways. The category definitions, historic background and key examples (using headphones and speakers) mapped out the field of mobile sound art. Each of the in-depth

case studies, discussed in the later chapters of the thesis was chosen from one of the categories (without aiming to be representative of them).

The third chapter 'Mobile And Sonic Methodologies' (p. 81ff.) developed a methodology suitable for exploring mobile sound art through ethnographic inquiry. Media ethnographic discussions around domestication (Silverstone & Hirsch, 1992) and the Internet (Hine, 2000) were rendered problematic by the mobile context (Hartmann, 2006). I built on Silverstone and Sujon (2005) and Gauntlett (2007) to argue that participation in mobile sound art can be regarded as an act of creative making, and extended this argument with what Pope (2005) calls "ambulant methodology" to account for the act of walking in mobile sound art research. Drawing on DeNora's concept of the 'musical event' I developed my concept of the 'sonic event' and explored how it is constituted through the experience of the 'user'. Finally, I presented an overview of my research activities.

Chapter four 'Musical Telephones Old and New: A Media Archaeology' (p. 101ff.) discussed the art project 'Pophorns' (by Sandelin & Torstensson, 2007) and the commercially successful iPhone 'Ocarina' (Wang, 2008) - both mobile phones turned *musical instrument* - in the light of the musical history of the telephone. I explored how the early decades of telephonic history featured public music performances, broadcasting services and improvised telephone jam sessions. Also, a century ago, the Telharmonium turned the entire telephone network into a musical instrument. This historic perspective allowed me to critically interrogate claims regarding the 'newness' of using telephones as musical instruments.

In chapter five, '"Small Texts"?: Text Messages, Art and Public Spheres' (p. 150ff.), I argued that mobile sound art *platforms* such as 'smSage' (by Redfern & Borland, 2007) not only happen in public space, they also have potential to *create* public spheres. This

and two other artworks highlighted how art participation by text message could mobilise dormant public spheres and make them "vibrate", and also how they could feature in moving issues from the periphery to the centre of the public sphere. I took a critical stance in exploring how complex and difficult it is to engage the audience to actually send in their 'small texts' that establish the artworks. The chapter considered how the audience contributions of these artworks 'make' (and 'break) transient micro-publics that have features of episodic, occasional and abstract publics.

Chapter six 'Polyphonies of Footsteps' (p. 186ff.) discussed the piece 'Aura' (by Symons, 2007), analysing the audience experience (as expressed in participant interviews) with reference to De Certeau's sociospatial concepts. The distinction of distancing views and strategic maps on one hand and multi-sensory, embodied, tactical footsteps on the other hand, provided valuable insight for understanding *sonified mobility* in mobile sound art. I examined how notions of sonic control were negotiated in the piece, why the audience felt self-conscious in participating in the artwork and ambiguous towards their everyday mobile media experiences. The notion of 'spaces rubbing together' allowed me to further understand the (sometimes) dissonant polyphonies of the audience experience.

The seventh chapter, 'Rhythmanalysis. Lefebvre on a GPS Sound Walk' (p. 216ff.), made Lefebvre's temporal concept of rhythmanalysis productive for analysing both the role of the audience and of the artist of 'Core Sample' (by Rueb, 2007), a mobile sound artwork featuring *placed sounds*. I argued that rhythmanalysis can be understood as an artistic methodology (drawing on an artist interview), but is also productively deployed to understand the audience experience (drawing on guest book entries, and my own experience) of this GPS sound walk that gives 'voices' to secret historic layers of an urban landscape. One of the findings was that the audience frequently reported experiencing

moments of sensory synchronicity, where listening to the headphones and the soundscape while walking the island directed the attention of participants to auditory, but also multi-sensory details and rhythms in their surroundings and in the piece. The chapter also pointed out how the auditory and embodied immersion into the experience at the same time allowed for critical reflection, and made many audience members feel more connected to the location. I also showed how the organic rhythm of walking is the one rhythm that relates to all the other rhythms, such as the linear rhythms of the GPS satellites or the secret rhythms of island histories, allowing me to understand walking as embodied knowledge production in mobile sound art.

Issues that guided the research across the case studies were questions concerning the quality of the sonic experience, the engagement with urban, public and networked spaces, the role of sound, and the relationship between art experiences and everyday media experience. Three key areas my thesis makes an intervention in are in relation to (1) auditory ways of mobilising and making public spaces, (2) non-verbal and embodied media practices, and (3) rhythms and scales of mobile media experiences.

2. Auditory Ways of Mobilising and Making Public Media Spaces

This thesis has explored how public spaces are mobilised by media, and has focussed in particular on auditory ways of making public media spaces. The works of mobile sound art that I analysed engage with existing urban contexts by 'adding' an art and media layer; the new layer inhabiting or squatting specific public spaces, and thereby 'co-making' and mobilising them. Despite using globally connected media (such as GPS or mobile phones) these pieces turned out to be (maybe surprisingly) site-specific: you have to en-

gage with a very specific location, be present in it with your body and the spatial interactions of several people co-create this ephemeral art space.

The anytime/anywhere/anyone promise often made in mobile media advertising can also often be found in discourses concerned with mobile media art - and has been critically interrogated over the course of this thesis to reveal how the specificity of places, times and people matter. The *contexts* of mobile sound art (for example the festival, hosting institution or neighbourhood) that frames the piece has a more important role in enabling and making (or breaking) pieces than is often assumed in media and public art. Drawing on Habermas, I pointed out how *abstract* media public in mobile contexts absorb *occasional* and *episodic* aspects. The engagement with the particular local context of mobile sound art, the actual street, community, neighbourhood the piece exists in, and the actual people the piece is made by, when experienced *in situ*, in practice, in a pragmatic way, are often in contrast to the aims and concepts of the piece. This critique is of course not unique to mobile sound art, it is a wider critique of a focus on the concepts of artworks, rather than the actual experience of them. However it becomes amplified in interactive pieces (where the role of the audience is crucial in establishing the piece), an ampfication that operates in specific ways in relation to mobile sound art. Public spaces are mobilised, or made in auditory ways only when people actually participate in the works of mobile sound art; they make the piece and mobilise public spaces by playing a mobile phone turned *musical instrument*, sending a text message to a *sound platform*, generating a trajectory that becomes *sonified mobility* or by remixing *placed sounds* by walking.

3. Non-verbal, Embodied Media Practices: Quality of Engagement

A second theme arising was the quality of engagement with public spaces and landscapes, and this was pursued especially by attending to non-verbal and embodied practices. De Certeau claims that knowledge is situated in practices: 'their practices know it - their moves, behaviours, ways of talking or walking' (Certeau, 1984, p. 71), and these practices are at the heart of mobile art. Computers are often associated with rational thought, written communication, screens, and immobile bodies. This research has illustrated how mobile bodies and auditory interactions can supplement (or even replace) screen-based and immobile paradigms of human-computer interaction. Non-verbal, embodied, multi-sensory and poetic practices have been key to understanding these mobile media experiences.

The concern with traditional visual computer interfaces is reflected in the metaphors used in locative arts discourses, examples are the "city as canvas" or the "person as cursor in the city" (Hemment, 2006a, p. 350). In this thesis I drew on Hight's sonic metaphors of places "speaking" of layers of information (Hight, 2006, p. 5) and "resonating" with multiple layers (Hight, 2006, p. 2) to account for the multi-sensory experience of mobile media use in public spaces. This thesis contributed to developing new metaphors for describing our increasingly complex mobile media experiences: Listening to the polyphonies of footsteps, attending to multiple rhythms, exploring the resonance of mobilised public spheres, are examples of this.

4. Rhythms and Scales of Mobile Media Experiences

This thesis explored the rhythms (temporal focus) and scales (spatial focus) of mobile media experiences and the relationship between them. The discussion of media mobility has pointed to the various relevant scales of fingers, bodies, cities, networks. These human, urban, social and media scales are curated to form a mobile sound experience in each of the works of mobile sound art discussed in this thesis, including the trajectory of the body moving through space (such as walking in a park, driving on a road, cycling on path), the relation of the finger to the device (stroking the screen, pressing a button or gripping the device, for example), the device in relation to the body (for example in a pocket, held out in front of the head or spinning it around the body), the infrastructure behind the devices (such as GPS satellites, phone masts or the Internet) and all of these in relation to other users. The experimental space of these artworks illustrated how meaningful, poetic, human interaction with these potentially abstract, global, inhuman scales can be possible.

The artworks are often surprisingly modest (taking into consideration the scale of the underlying networks) and the audience encounter is carefully framed: Not the entire planet, country, city of even neighbourhood, rather a street corner, a square, a park - often traditional public spaces that are mobilised by mobile media in experimental ways. Not the entire Internet, or all 'multi' media, but a few networked devices, specific sounds that are engaging with these public spaces: these delineate the spaces under consideration.

As we have seen, mobile technology enables sound art to move into spaces that are a part of people's everyday life, such as streets or parks. But even if participants do not need to visit a dedicated art space, they still need to devote time to exploring a piece.

This temporal aspect of locative media (art) and public sound art is often neglected. Current media (art) debates are often heavily locative and space-centred, exploring the properties of the 'new' hybrid spaces or digital landscapes. Equally, many discussions of sound art are heavily biased towards space - and not time. As Bandt (Bandt, 2005, p. 132) criticises: "While the spatial features of sound art are often discussed as they are so easily perceivable, the temporal design is often much less obvious, as it demands substantial listening time and effort for it to be understood." Time and space need to be discussed together. You need time to explore space. How long is an audience willing to spend in a concert, a gallery sound installation, to participate in mobile sound art? This thesis has further contributed to the temporal debate of mobile art by mobilising Lefebvre's concept of rhythmanalysis. This enabled me to pay attention to the multitude of rhythms that make up mobile media experiences.

Being 'offline' or 'online' as one distinctive media rhythm is fading and also distinctions of using GPS or the internet on the one hand and walking along the street or sitting in a café on the other are becoming less prominent. Instead we experience everyday life as a polyphony of various rhythms, including media rhythms. These poly-rhythms are often rather seamless, but there are also interesting moments of friction when media and physical spaces are 'rubbing together' in various ways, as this thesis has illustrated.

Pace is also key for how we experience scales and rhythms. The pace of experiencing our environment depends on whether we are walking, driving or cycling, to name a few. The relationship between rhythms of the body in relation to the physical environment, the distinct pace of the mobile interaction, is translated into musical or sonic interaction in unique ways in each of the case studies. In bringing together considerations of the rhythms and scales of mobile sonic interaction, my research paid attention to the relation between temporal, spatial and social aspects of mobile media encounters.

5. Resonance

In his disarming way of questioning our perception, Von Foerster states: "We see with our legs. Why? Walk! See, everything looks different now, doesn't it?" (Foerster, 2003, my translation). If we apply this visual statement to listening we could claim to 'hear with our legs'. And this might be even more true, as we also pick up sound with our entire body, e.g. vibrations of the floor with our feet. A key embodied aspect of mobile media experience this thesis identified is the *walking body as an interface for hybrid spaces* or media cities. Walking requires you to use your entire body, and doing so stands in stark contrast to most of our traditional understandings of interactions with networks - where clicking a mouse or tapping the screen is thought to be all the movement that is involved or required.

The way embodied mobility relates to sense perception (especially sound) and how this frames our interactions with our (physical and media) environment resounded across this thesis. Exploring mobile sound has enabled me to contribute to a deeper and more critically informed understanding of media art in hybrid spaces. I have also demonstrated how sonic interactions and embodied mobility were designed and experienced in specific ways in each case study, as accounted for in interviews, guest books, online forums, etc. In tracing the *topos* of the musical telephone, discussing the making and breaking of relevant micro publics, accounting for the polyphonies of footsteps and unwrapping bundles of rhythms, this thesis contributed to understanding complex media experiences in hybrid spaces. This research has brought together sound art and digital technologies to produce new insights into how the two come together to reorganise public space and its experience, if not permanently then in ways that open possibilities and critique what exists.

IX. Bibliography

Acconci, V. (2004). Leaving Home. Notes on Insertions into the Public. In F. Matzner (Ed.), *Public Art. A Reader* (pp. 28-33). Hatje Cantz Verlag.

Adrian, R. (1995). Kunst und Telekommunikation. 1979-1986: Die Pionierzeit. *Springerin*, *1*, 10-11.

Adrian, R. (1983). telephone concert. http://www.t0.or.at/ radrian/PHONEMUSIC/ telemusic.html.

Albert, S. (2004). Locative Literacy. *Mute*.

Altena, A. (2006). Publishing Everywhere and Anywhere. Droombeek in Enschede. *Open. Cahier on Art and the Public Domain, 11* (Public Agency in Hybrid Space), 134-139.

Andersen, K. (2008). *Black box: exploring simple electronic interaction*. Paper presented at the 2nd international conference on Tangible and embedded interaction, Bonn, Germany.

Andersen, K., & Berzowska, J. (2006). Worn Technology. The Alteration of Social Space. *Open. Cahier on Art and the Public Domain, 11* (Public Agency in Hybrid Space), 148-157.

Andrejevic, M. (2009). *iSpy: Surveillance and Power in the Interactive Era (Cultureamerica)*. University Press of Kansas.

Anonymous (1907). The Music of the Future. *N.Y. Press*, p. In: Reynold'sWeidenaar's http://magneticmusic.ws/mmclip19070217a.PDF.

Anonymous (1906). "MAGIC MUSIC FROM THE 'Telharmonium'". *New York Times*.

Araya, K. (2004). Walking in the City: The Motif of Exile in Performances by Krzysztof Wodiczko and Adrian Piper. Concordia University.

Arns, I. (2004). Interaction, Participation, Networking. Art and Telecommunication. In R. Frieling & D. Daniels (Eds.), *Medien Kunst Netz 1 /Media Art Net 1 : Medienkunst im Überblick / Survey of Media Art* (also online at http:/ /www.medienkunstnetz.de/themes/overview_of_media_art/communication/print/). Wien: Springer.

Arns, I., & Daniels, D. (2004). Media art can only be conveyed by multimedia. Sound and Image. Editorial. http://www.medienkunstnetz.de/themes/image-sound_relations/editorial/print/.

Aronson, S. (1977). Bell's Electrical Toy: What's the Use? The Sociology of Early Telephone Usage. In I. d. S. Pool (Ed.), *The social impact of the telephone* (pp. 15-39). Cambridge, Mass.; London: M.I.T. Press.

Electronica, A. (2008). Prix Ars Electronica - Awards of Distinction. http://www.aec.at/ en/prix/winners_awards.asp.

Baig, E. C. (2008). The iTunes App Store is iPhone's killer app; free stuff. Retrieved 15 October 2009, http://www.usatoday.com/tech/columnist/edwardbaig/2008-12-10-itunes-app-store_N.htm.

Baig, E. C., & LeVitus, B. D. M. (2009). *Iphone for Dummies*. Indianapolis: John Wiley & Sons.

Bain, M. (2005). Psychosonics and the Modulation of Public Space. On subversive Sonic Techniques. *Open. Cahier on Art and the Public Domain. 09* (Sound in Art and Culture), 94-108.

Bandt, R. (2005). Designing Sound in Public Space in Australia: a comparative study based on the Australian Sound Design Project's online gallery and database. Organised Sound, *10*(2), 129-140.

Banff. (n.d.). BNMI Co-Production Archives 'G'. Retrieved August 2009, http://www.banffcentre.ca/bnmi/coproduction/archives/s.asp.

Bartholl, A. (2004). Silver Cage.

Bartlem, E. (2005). Reshaping Spectatorship: Immersive and Distributed Aesthetics. *Fibreculture*, *Issue 7 - distributed aesthetics*.

Bassett, C. (2003). How many movements? In M. Bull & L. Back (Eds.), *The Auditory Culture Reader* (pp. 343-355). Berg.

Bassoli, A., Moore, J., & Agamanolis, S. (2006). tunA: Socializing Music Sharing on the move. In K. O'Hara & B. Brown (Eds.), *Consuming Music Together: Social and Collaborative Aspects of Music Consumption Technologies* (pp. 151-172). Springer.

Basualdo, C., & Laddaga, R. (2004). Rules of Engagement: Art and Experimental Communities. *Artforum*, *XLIII*(7), 166–169.

BBC News. (2007). 'Talking' CCTV scolds offenders. http://news.bbc.co.uk/2/hi/uk_news/england/6524495.stm.

Beer, D. (2007). Tune Out: Music, Soundscape and the Urban Mis-en-scene. *Information, Communication & Society*, *10*(6), 846 – 866.

Behrendt, F. (2004). *Handymusik : Klangkunst und "mobile devices*. Osnabrück: Electronic Publ.

Behrendt, F. (2008). Texting and Calling Public Spheres: Mobile Phones, Sound Art and Habermas. In M. Hartmann, P. Rössler, & J. R. Höflich (Eds.), *After the Mobile Phone? Social Changes and the Development of Mobile Communication* (pp. 35-54). Berlin: Frank & Timme.

Behrendt, F. (2005). From Calling a Cloud to Finding the Missing Track: Artistic Approaches to Mobile Music. Paper presented at the Mobile Music Workshop at NIME, Vancouver.

Behrendt, F. (2006). Sound Art on the Move. Paper presented at the SoundAsArt: Blurring of the Boundaries, Aberdeen.

Ben. (2007). Interview. Part of my field work. 27.04.2007, Cambridge (UK).

Berker, T., Hartmann, M., Punie, Y., & Ward, K. (2005). *Domestication of Media and Technology*. Open University Press.

Bickford, T. (forthcoming). Earbuds Are Good for Sharing: Children's Sociable Uses of Headphones at a Vermont Primary School. In S. Gopinath & J. Stanyek (Eds.), *Oxford Handbook of Mobile Music* (pp. ?-?).

Bird, S. E. (2003). *The audience in everyday life : living in a media world*. New York: Routledge.

Blaine, T. (2005). The Convergence of Alternate Controllers and Musical Interfaces in Interactive Entertainment. Paper presented at the International Conference on New Interfaces for Musical Expression (NIME), Vancouver, Canada.

Bleecker, J. (2005). Design for Public Interfaces: Mobile Phones as Civic "Intermediaries". Paper presented at the CHI05. Conference on Human Factors in Computing Systems. Workshop "Engaging The City: Public Interfaces As Civic Intermediary", New York.

Bleecker, J., & Knowlton, J. (2006). Locative Media: A Brief Bibliography And Taxonomy Of Gps-Enabled Locative Media. *Leonardo Electronic Almanac*, *14*(3).

Blesser, B., & Salter, L.-R. (2006). *Spaces Speak, Are You Listening?: Experiencing Aural Architecture*. The MIT Press.

Borland, R., & Redfern, T. (2007). smSage: About. http://www.eclectronics.org/projects/smsage/about.php.

Boston Harbour Islands Partnership. (n.d.). Boston Harbor Islands: Spectacle Island. Retrieved July 2008, http://www.bostonislands.org/isle_spectacle.asp.

Braun, R. (1999). *Internetkulturen*. Wien:.

Breitsameter, S. (2004). Sonic Art in Herzian Space. Teri Rueb in Conversation with Sabine Breitsameter. *SWR2*.

Briggs, A. (1977). The Pleasure of the Telephone: A chapter in the prehistory of media. In I. d. S. Pool (Ed.), *The social impact of the telephone* (pp. 40-65). Cambridge, Mass.; London: M.I.T. Press.

Brockhaus. (2001). *Brockhaus Musik. Peronen, Epochen, Sachbegriffe*. Leipzig: F. A. Brockhaus.

Brown, N. (2000). Sonic Boom. *Frieze*, *54*.

Brown, N. (2006). The flux between sounding and sound: Towards a relational understanding of music as embodied action. *Contemporary Music Review*, *25*(1/2), 37 - 46.

Brucker-Cohen, J. (n.d.). MUSICAL/DEVICES - 2001. Retrieved 20 November 2009, http://www.mee.tcd.ie/~bruckerj/projects/musicaldevices.html.

Brucker-Cohen, J. (2007). SMSage makes surveillance fun. http://blog.makezine.com/archive/2007/09/smsage_makes_surveillance.html.

Brucker-Cohen, J., Redfern, T., & Murphy, D. (2003). Simpletext.

Bryan-Kinns, N., & Healey, P., G.T. (2004). *Daisyphone: Support for Remote Music Collaboration*. Paper presented at the New Interface for Musical Expression NIME, Hamamatsu (Japan).

Bull, M. (2000). *Sounding Out the City: Personal Stereos and the Management of Everyday Life*. Berg.

Bull, M. (2007). *Sound Moves: IPod Culture and Urban Experience*. Routledge.

Bull, S. (n.d.). Cellphonia. Retrieved April 2008, http://cellphone.el.net/listen/.

Bull, S., Gresham-Lancaster, S., & Perkis, T. (2006). CELLPHONIA: In The News. Paper presented at the Third International Workshop for Mobile Music, Brighton.

Burns, P. M., & O'Regan, M. (2008). Everyday Techno-social Devices in Everyday Travel Life: Digital Audio Devices in Solo Travelling Lifestyles. In P. M. Burns & M. Novelli (Eds.), *Tourism and mobilities: local-global connections* (pp. 146-186). CABI Publishing.

Busoni, F. (1911). *Sketch of a New Esthetic of Music*. New York: Schirmer.

Calhoun, C. J. (Ed.). (1992). *Habermas and the public sphere*. Cambridge, Mass ; London: MIT Press.

Candy, L., & Edmonds, E. (2001). Interaction in Art and Technology. *Crossings: eJournal of Art and Technology*, *Volume 1, Issue 2*.

Cardiff, J. (2004). Her Long Black Hair. http://www.cardiffmiller.com/artworks/walks/longhair.html.

Careri, F. (2001). *Walkscapes: Walking as an Aesthetic Practice (Land & Scape)*. Gustavo Gili.

Castells, M. (2005). *The Network Society: A Cross-cultural Perspective*. Edward Elgar Publishing Ltd.

Cater, K., Fleuriot, C., Hull, R., & Reid, J. (2005). Experience Design Guidelines for Creating Situated Mediascapes. In Technical Report HPL-2005-181. 20051021. HP Labs.

Pompidou, C. G. (2004). *Sons & lumieres : une histoire du son dans l'art du XXe siecle*. Paris: Centre Pompidou.

Certeau, M. D. (1984). *The Practice of Everyday Life*. Berkley: University of California Press.

Clifford, J. (1997). Spatial Practices: Fieldwork, Travel, and the Discipline of Anthropology. In A. Gupta & J. Fergusson (Eds.), *Anthropological Locations: Boundaries and Grounds of a Field Science* (pp. 185-222). Berkley: University of California Press.

Collins, P., & Coleman, S. (Eds.). (2006). *Locating the Field: Space, Place and Context in Anthropology*. Berg.

(1891). Concert Music. *Scientific American*, p. 225.

Connor, S. (1997). Voice, Technology and the Victorian Ear. Paper presented at the Science and Culture 1780-1900, Birkbeck College, London.

Cook, G. (2008). Arts sweep 2008 AICA awards. http://gregcookland.com/journal/2008/02/arts-sweep-2008-aica-awards.html.

Cooper, S., Dalea, C., & Spencer, S. (2009). A tutor in your back pocket: reflections on the use of iPods and podcasting in an undergraduate popular music programme. *British Journal of Music Education*, *26*, 85-97.

Corby, T. (2006). *Network Art: Practices and Positions*. Routledge.

COST. (n.d.). European Cooperation in Science and Technology. Retrieved January 2010, http://www.cost.esf.org/.

Couldry, N. (2003). Passing Ethnographies: Rethinking the Sites of Agency an Reflexivity in a Mediated World. In P. D. Murphy & M. M. Kraidy (Eds.), *Global Media Studies: Ethnographic Perspectives* (pp. 40-56). London: Routledge.

Cox, C., & Warner, D. (2005). Introduction to "Modes of Listening". In C. Cox & D. Warner (Eds.), *Audio Culture. Readings in Modern Music* (pp. 65-66). New York: Continuum.

Crossley, N., & Roberts, J. M. (Eds.). (2004). *After Habermas: new perspectives on the public sphere*. Oxford: Blackwell Publishing/The Sociological Review.

Dahlgren, P. (2005). The Internet, Public Spheres, and Political Communication: Dispersion and Deliberation. *Political Communication*, *22*, 147–162.

Daniels, D. (2003). Strategien der Interaktivität. In D. Daniels (Ed.), *Vom Readymade zum Cyberspace : Kunst, Medien, Interferenzen*. Ostfildern-Ruit: Hatje Cantz.

Daniels, D. (2004). Nam June Paik, »Schallplatten-Schaschlik« Exposition of Music – Electronic Television. http://www.medienkunstnetz.de/werke/schallplattenschaschlik/.

Dauerer, V. (2002). Kunst reflektiert den Code. Interview with Matthew Fuller. *die tageszeitung (taz)*.

David. (2007). Interview. Part of my field work. 27.04.2007, Cambridge (UK).

de Gournay, C. (2002). Pretense of intimacy in France. In J. E. Katz & M. Aakhus (Eds.), *Perpetual contact: mobile communication, private talk, public performance* (pp. 193-205). Cambridge: Cambridge University Press.

De Oliveira, N., Oxley, N., & Petry, M. (2003). *Installation art in the new millennium : the empire of the senses*. New York: Thames & Hudson.

de Sola Pool, I. (1977). Alternative Paths of Development: the Early Years: Editor's comment. In I. d. S. Pool (Ed.), *The social impact of the telephone* (pp. 12-14). Cambridge, Mass.; London: M.I.T. Press.

Debatty, R. (2007). My Cage (Silence for Cellphone). Retrieved 20 November 2009, http://www.we-make-money-not-art.com/archives/2007/01/-jonah-brucker-.php.

DeNora, T. (2003). *After Adorno: Rethinking Music Sociology*. Cambridge University Press.

DeNora, T. (2004). Musical Practice and Social Structure: A Toolkit. In E. Clarke & N. Cook (Eds.), *Empirical Musicology: Aims, Methods, Prospects* (pp. 35-56). Oxford University Press Inc, USA.

docjazz4. (2009). You Raise Me Up on Ocarina for iPod Touch. Retrieved 15 October 2009, http://www.youtube.com/user/docjazz4#p/u/120/Nad5AJaIcBI.

drakirr. (2008). Pophorning at Herrgården. Retrieved February 2010, http://www.youtube.com/watch?v=X-yuvQRyVXc&eurl=http://www.unsworn.org/blog/mobile/2008/06/herrgarden-beatboxing/&feature=player_embedded.

Dunne, A. (1999). *Hertzian Tales: Electronic Products, Aesthetic Experience and Critical Design*. RCA Computer Related Design Research.

Dyer, M. (2004). *The Essential Guide to Geocaching: Tracking Treasure with Your GPS*. Fulcrum Group.

Dyson, F. (2009). *Sounding New Media: Immersion and Embodiment in the Arts and Culture*. University of California Press.

Editor's Introduction: Reconfiguring Place and Space in New Media Writing. *The Iowa Review Web*, *8*(1).

Elden, S. (2004). Rhythmanalysis: An Introduction. In H. Lefebvre (Ed.), *Rhythmanalysis: Space, Time and Everyday Life* (pp. vii-xv). London: Continuum.

Elsenaar, A., & Stolk, T. (2002). BubL Space. Retrieved January 2010, http://bublspace.com/.

Emma. (2007). Interview. Part of my field work. 28.04.2007, Cambridge (UK).

Enter_. (n.d.). aura-the stuff that forms around you - Steve Symons. Retrieved January 2008, http://www.enternet.org.uk/enternet/unknownterritories/event.acds?instanceid=2682312&context=2659815.

Enter_. (n.d.). Enter_ Unknown Territories. Retrieved January 2008, http://www.enternet.org.uk/enternet/unknownterritories/home.acds?context=2659795.

Essl, G., Wang, G., & Rohs, M. (2008). *Developments and Challenges Turning Mobile Phones into Generic Music Performance Platforms*. Paper presented at the In Proceedings of Mobile Music Workshop, Vienna.

Falkheimer, J., & Jansson, A. (Eds.). (2006). Geographies of Communication : The Spatial Turn in Media Studies. Göteborg: Nordicom.

Farshi, O. (2009). App Review: Leaf Trombone: World Stage — Like American Idol But With Leaves. Retrieved 15 October 2009, http://theappleblog.com/2009/04/17/app-review-leaf-trombone-world-stage-like-american-idol-but-with-leaves/.

Ferguson, K. (2008). Aural addictions. Continuum: Journal of Media & Cultural Studies, *22*(1), 69 - 77.

Finn, M. (2005). Gaming Goes Mobile: Issues and Implications. *Australian Journal of Emerging Technologies and Society*, *3*(1).

Fischer, C. S. (1992). *America calling : a social history of the telephone to 1940*. Berkeley ;Oxford: University of California Press.

Foerster, V. (2003). Sehen mit den Beinen. Youtube video from Talk at Interface II in Hamburg, 2003. Retrieved 20 November 2009, http://www.youtube.com/watch?v=okjL-IddFug&feature=player_embedded#t=19.

Föllmer, G. (1999). Klangorganisation im öffentlichen Raum. In H. d. l. Motte-Haber (Ed.), *Klangkunst : tönende Objekte und klingende Räume* (pp. 191–227). Laaber: Laaber Verlag.

Föllmer, G. (2004). Audio Art. In R. Frieling & D. Daniels (Eds.), *Medien Kunst Netz 1 /Media Art Net 1 : Medienkunst im Überblick / Survey of Media Art* (pp. 80-117). Wien: Springer.

Föllmer, G. (2005a). Electronic, aesthetic and social factors in Net music. Organised Sound, *10*(3), 185 - 192.

Föllmer, G. (2005b). Lines of net music. Contemporary Music Review, *24*(6), 439 - 444.

Fraser, N. (1992). Rethinking the Public Sphere: A Contribution to the Critique of Actual Existing Democracy. In C. J. Calhoun (Ed.), *Habermas and the public sphere* (pp. pp109-142). Cambridge, Mass ; London: MIT Press.

Frauke. (2007a). Self Interview 01 (Trying to take out aura), part of my field work. 28.04.2007, Cambridge (UK).

Frauke. (2007b). Self Interview 04 (Me taking out aura). part of my field work. 28.04.2007, Cambridge (UK).

Fuller, M. (2003). *Behind the blip : essays on the culture of software*. Brooklyn, NY: Autonomedia.

Fuller, M. (2005). *Media Ecologies: Materialist Energies in Art and Technoculture (Leonardo Book)*. The MIT Press.

Fuller, M. (2009). The Telephone and its Keys. Retrieved January 2010, http://www.spc.org/fuller/texts/the-telephone-and-its-keys/.

Fuller, M., & Harwood, G. (2004). TextFm, an account. In M. Tuters & R. Smite (Eds.), *Acoustic Space. Trans Cultural Mapping* (pp. 238-241). Riga: The Centre for New Media Culture RIXC.

Futuresonic. (2004). InterUrban, an interactive narrative by Jeff Knowlton, Naomi Spellman & Jeremy Hight. Retrieved July 2008, http://www.futuresonic.com/futuresonic/mobile_connections/.

Galloway, A. (2008). *A Brief History of the Future of Urban Computing and Locative Media*. Carleton University, Ottawa, Canada.

Galloway, A., & Ward, M. (2006). Locative Media As Socialising And Spatializing Practice: Learning From Archaeology. *Leonardo Electronic Almanac*, *14*(3).

Garnicnig, B., & Haider, G. (2008). Craving. In N. Kirisits, F. Behrendt, L. Gaye, & A. Tanaka (Eds.), *Creative Interactions - The Mobile Music Workshops 2004-2008* (pp. 52-53). Vienna: University of Applied Arts.

Gauntlett, D. (2007). *Creative Explorations: New Approaches to Identities and Audiences*. Routledge.

Gaye, L. (forthcoming). *tba*. Göteborg University, Göteborg.

Gaye, L., & Holmquist, L. E. (2004a). *In duet with everyday urban settings: a user study of sonic city*. Paper presented at the Proceedings of the 2004 conference on New interfaces for musical expression, Hamamatsu, Shizuoka, Japan.

Gaye, L., & Holmquist, L. E. (2004b). *Mobile Music Making with Sonic City*. Paper presented at the Ubicomp 2004, Nottingham (UK).

Gaye, L., & Holmquist, L. E. (2006). Performing Sonic City: Situated Creativity In Mobile Music Making. *Leonardo Electronic Almanac*, *14*(3).

Gaye, L., Mazé, R., & Holmquist, L. E. (2003). *Sonic City: the urban environment as a musical interface*. Paper presented at the Proceedings of the 2003 conference on New interfaces for musical expression, Montreal, Quebec, Canada.

Gaye, L., Holmquist, L. E., Behrendt, F., & Tanaka, A. (2006). Mobile Music Technology: Report on Emerging Community. Paper presented at the International Conference on New Interfaces for Musical Expression (NIME), Paris.

Geertz, C. (1973). *Interpretation of Cultures*. Basic Books.

Geraci, J. (n.d.). Grafedia. Retrieved July 2008, http://grafedia.net.

Nationalmuseum, G. (2005). *Leve sieht Paik*. Nürnberg: Verlag des Germanischen Nationalmuseums.

Gertich, F. (1999). Klangskulpturen. In H. d. l. Motte-Haber (Ed.), *Klangkunst. Tönende Objekte und klingende Räume* (pp. 135-190). Laaber: Laaber.

Geser, H. (2004). Towards a Sociological Theory of the Mobile Phone. *Online Publication 'Sociology in Switzerland: Sociology of the Mobile Phone'*.

Gillian, N., O'Modhrain, S., & Essl, G. (2009). *Scratch-Off: A gesture based mobile music game with tactile feedback*. Paper presented at the International Conference on New Interfaces for Musical Expression (NIME), Pitsburgh.

Goggin, G. (2009). Adapting the mobile phone: The iPhone and its consumption. *Continuum: Journal of Media & Cultural Studies*, *23*(2), 231 - 244.

Gopinath, S. (2005). Ringtones, Or the Auditory Logic of Globalization. *First Monday*, *10*(12).

Gordon, J. (2007). The Mobile Phone and the Public Sphere. *Convergence*, *13*(3), 307-319.

Graham, J. (2009). Ocarina, Leaf Trombone lead big parade of iPhone apps. *USA Today*.

Grau, O. (2007). *MediaArtHistories*. The MIT Press.

Grau, O. (2003). *Virtual art : from illusion to immersion* ([Rev. and expanded ed.] ed.). Cambridge, Mass: MIT Press.

Green, J.-A. (2007). smSage. http://transition.turbulence.org/networked_music_review/2007/09/06/smsage/.

Großmann, R. (2005). Die multimediale Herausforderung und die Wissenschaft von der Musik. *Neue Zeitschrift für Musik*, *4/2005*, 22-24.

Großmann, R. (2006). Audiowissenschaft = Musikwissenschaft + Medienwissenschaft. In K. a. S. Hickethier, Frank (Ed.), *Radioforschung/Audioforschung*. Hamburg:.

Guest Book, D. A. (2007). Core Sample. Guest Book. Provided by Teri Rueb.

gumstix. (n.d.). About gumstix. http://www.gumstix.com/about.html.

Haake, B. A. (2006). *Individual music listening in workplace settings: An exploratory survey of offices in the UK*. Paper presented at the 9th International Conference on Music Perception & Cognition, Bologna.

Habermas, J. (1996). *Between facts and norms : contributions to a discourse theory of law and democracy*. Cambridge: Polity.

Hakansson, M., Rost, M., & Holmquist, L.-E. (2007). *Gifts from friends and strangers: A study of mobile music sharing*. Paper presented at the 10th European Conference on Computer Supported Co-operative Work (ECSCW), Limerick.

Hall, T., Lashua, B., & Coffey, A. (2008). Sound and the Everyday in Qualitative Research. *Qualitative Inquiry*, *14*(6), 1019-1040.

Harris, Y. (2006). Inside-out Instrument. *Contemporary Music Review*, *25*(1/2), 151-162.

Harris, Y. (2007). Taking Soundings – Investigating Coastal Navigations and Orientations in Sound. Paper presented at the Mobile Music Workshop, Amsterdam.

Hartmann, M. (2006). A Mobile Ethnographic View on (Mobile) Media Usage? In J. R. Höflich & M. Hartmann (Eds.), *Mobile communication in everyday life : ethnographic views, observations and reflections* (pp. 273-298). Berlin: Frank & Timme.

Hasan, Z., & Widerberg, R. (2006). *IMPROVe. Mobile architecture for sonic socio-cultural exchange*. Paper presented at the Third International Workshop for Mobile Music, Brighton.

Hemment, D. (2006a). Locative Arts. *Leonardo*, *39*(4), 348-355.

Hemment, D. (2006b). Locative Media. *Leonardo Electronic Almanac*, *14*(3).

Packard, H. (n.d.). Featured mediascaper: Teri Rueb. Retrieved 26.06.2008, http://www.mscapers.com/features/rueb.

Packard, H. (n.d.). Featured mediascaper: Teri Rueb. Retrieved 26.06.2008, http://www.mscapers.com/features/rueb.

Packard, H. (n.d.). mscape. Retrieved 26.06.2008, http://www.mscapers.com/.

Packard, H. (n.d.). mscapeFest 2007. Retrieved 26.06.2008, http://www.mscapers.com/mscapeFest07.

Highmore, B. (2002). *Everyday Life and Cultural Theory: An Introduction*. Routledge,an imprint of Taylor & Francis Books Ltd.

Highmore, B. (2006). *Michel De Certeau: Analysing Culture*. Continuum International Publishing Group Ltd.

Hight, J. (2006). Views From Above: Locative Narrative and the Landscape. *Leonardo Electronic Almanach*, *14*(07-08).

Hine, D. C. M. (2000). *Virtual Ethnography*. Sage Publications Ltd.

Hjorth, L. (2007). The Game of Being Mobile. One Media History of Gaming and Mobile Technologies in Asia-Pacific. *Convergence*, *13*(4), 369-381.

Holmberg, M., Melinder, T., & Moulettes, M. (n.d.). Full Pull. Retrieved 01.09.2007, http://www.myspace.com/fullpull.

Horst, H., & Miller, D. (2006). *The Cell Phone: An Anthropology of Communication*. Berg.

Horwitz, J. (2009). Smule Leaf Trombone: World Stage. Retrieved 15 October 2009, http://www.ilounge.com/index.php/reviews/entry/smule-leaf-trombone-world-stage/.

Howard, P. N. (2002). Network Ethnography and the Hypermedia Organization: New Media, New Organizations, New Methods. *New Media & Society*, *3*(40), 550-574.

Huhtamo, E. (1995). Encapsulated Bodies in Motion: Simulators and the Quest for Total Immersion. In S. Penny (Ed.), *Critical Issues in Electronic Media* (pp. 159-186). New York: State University of New York Press.

Huhtamo, E. (1996). Time Traveling in the Gallery: An Archeological Approach in Media Art. In M. A. Moser, D. MacLeod, & B. C. f. t. A. (Eds.), *Immersed in Technology: Art and Virtual Environments* (pp. 233-268). Cambridge: MIT Press.

Huhtamo, E. (1997). From Kaleidoscomaniac to Cybernerd: Notes Toward an Archeology of Media. *Leonardo*, *30*(3), 221-224.

Huhtamo, E. (2000). From Cybernation to Interaction: a Contribution to an Archaeology of Interactivity. In P. Lunenfeld (Ed.), *The digital dialectic: new essays on new media* (pp. 96-110). Cambridge, Mass.; London: MIT.

Huhtamo, E. (2004a). An Archeology of Networked Art: A symptomatic Reading of 'The Messenger' by Paul DeMarinis. In A. Zapp (Ed.), *Networked narrative environments as imaginary spaces of being* (pp. 32-44). Manchester: MIRIAD/ FACT.

Huhtamo, E. (2004b). Hidden Histories of Mobile Media. *receiver*, *11*.

Huhtamo, E. (forthcoming). Dismantling the Fairy Engine: Media Archeology as Topos Study. In E. Huhtamo & J. Parikka (Eds.), *Media Archeology*. Los Angeles: California University Press.

Huhtamo, E. (forthcoming). Pockets of Plenty: An Archaeology of Mobile Media. In M. Rieser (Ed.), *Mobile Audiences*. TBA: TBA.

Huhtamo, E., & Parikka, J. (forthcoming). Introduction: An Archeology of Media Archeology. In E. Huhtamo & J. Parikka (Eds.), *Media Archeology*. Los Angeles: California University Press.

Hur, S., On Ni Wan, A., & Paterson, A. (2006). Locative Media, on and off the beaten track. *Leonardo Electronic Almanac*.

ICA Boston. (2007). Teri Rueb, Core Sample. In *Art on the Harbor Islands* Exhibition Booklet (pp. 5-6). Boston: ICA Boston.

Ippolito, J. (2003). Accommodating the Unpredictable: The Variable Media Questionnaire. In A. Depocas, J. Ippolito, & C. Jones (Eds.), *Permanence Through Change: The Variable Media Approach* (pp. 46-53). New York: Guggenheim Museum Publications.

Isabella, B., Paci Dalò, R., & Schemat, S. (1999). Interactive Art: Honorary mention: Augmented Reality Fiction. Retrieved July 2008, http://www.aec.at/en/archives/prix_archive/prix_projekt.asp?iProjectID=2254.

Jacobson, M. (2006). Janet Cardiff and George Bures Miller. In C. A. Jones (Ed.), Sensorium. Embodied Experience, Technology, and Contemporary Art (pp. 56-61). Cambridge: MIT.

Jensen, K.-B. (2006). Sounding the Media. *An Interdisciplinary Review and Research Agenda for Digital Sound Studies*. Nordicom Review, *27*(2), 7-33.

Jeremy1026, Docjazz4, PeaceShot, al., E. (n.d.). I just ordered a real ocarina. Retrieved 15 October 2009, http://www.smule.com/node/231.

John. (2007). Interview. Part of my field work. 28.04.2007, Cambridge (UK).

Jütte, R. (2004). *A History of the Senses: From Antiquity to Cyberspace*. Polity Press.

Kahn, D. (1999). *Noise, water, meat : a history of sound in the arts*. Cambridge, Mass. ; London: MIT Press.

Kahn, D. (2005). Audio Art in the Deaf Century. Retrieved 08 January 2009.

Kahn, D. (2006). Sound Art, Art, Music

Kahn, D., & Whitehead, G. (1992). *Wireless imagination: sound, radio, and the avant-garde*. Cambridge, Mass.; London: MIT.

Kalnins, K. (2004). Locative is a Case not a Place. Retrieved July 2009, http://db.x-i.net/locative/2004/000385.html.

Kasprzak, M. (2002). TEXT FM: Open Broadcasting System. An interview with Graham Harwood and Matt Fuller. YEAR ZERO ONE FORUM, *Spring 2002*(10).

Kester, G. H. (2004). *Conversation Pieces: Community and Communication in Modern Art*. University of California Press.

Kincaid, J. (2009). Smule Outdoes Itself Again: Leaf Trombone Is An Instant iPhone Classic. Retrieved 15 October 2009, http://www.techcrunch.com/2009/04/15/smule-outdoes-itself-again-leaf-trombone-is-an-instant-iphone-classic/.

Kincaid, J. (2008). Smule's Ocarina: This Is How You Build A Great iPhone App. Retrieved 15 October 2009, http://www.techcrunch.com/2008/11/07/smules-ocarina-a-textbook-example-of-how-to-build-a-great-iphone-app/.

Kirisits, N., Behrendt, F., Gaye, L., & Tanaka, A. (Eds.). (2008). *Creative Interactions - The Mobile Music Workshops 2004-2008*. Vienna: University of Applied Arts.

Kluitenberg, E. (2006). The Network of Waves. Living and Acting in a Hybrid Space. *Open. Cahier on Art and the Public Domain*, *11*(Hybrid Space), 6-16.

Knowlton, J., Spellman, N., Stow, B., & Hight, J. (n.d.). 43 North 118 West. Retrieved July 2008, http://34n118w.net/.

Kraan, A. (2006). To Act in Public though Geo-Annotation. Social Encounters though Media Art. *Open. Cahier on Art and the Public Domain 11* (Public Agency in Hybrid Space), 38-47.

Kubisch, C. (n.d.). Works with Electromagnetic Induction. Retrieved August 2009, http://www.christinakubisch.de/english/install_induktion.htm.

Kwastek, K., Arns, I., & Faulstich, N.-M. (2004). *Ohne Schnur : Kunst und drahtlose Kommunikation*. Frankfurt am Main: Revolver, Archiv für Aktuelle Kunst.

Kwastek, K. (n.d.). Taxonomies for New Media Art. Retrieved February 2010, http://vis.mediaartresearch.at/webarchive/public/view/mid:24.

LaBelle, B. (2006). *Background Noise: Perspectives on Sound Art*. New York.: Continuum.

Lacy, S. (Ed.). (1995). *Mapping the terrain : new genre public art*. Seattle, Wash: Bay Press.

Lanza, J. (1995). *Elevator music: a surreal history of muzak, easy-listening and other moodsong*. London: Quartet Books.

Lasen, A. (2003). A comparative study of mobile phone use in public spaces in London, Madrid and Paris. Retrieved 20 November 2009, http://www.dwrc.surrey.ac.uk/Portals/0/CompStudy.pdf.

Leahu, L., Thom-Santelli, J., Pederson, C., & Sengers, P. (2008). *Taming the situationist beast*. Paper presented at the Proceedings of the 7th ACM conference on Designing interactive systems, Cape Town, South Africa.

Lefebvre, H. (1991). *The Production of Space*. WileyBlackwell.

Lefebvre, H. (2008). *Critique of Everyday Life*. Verso.

Levin, G. (2003). Project Report for Dialtones (A Telesymphony). Retrieved 20 November 2009, http://www.flong.com/storage/pdf/reports/dialtones_report.pdf.

Licht, A. (2007). *Sound Art: Beyond Music, Between Catagories*. Rizzoli International Publications.

Liggins, D., Liggins, C., & Ocarina Workshop. (n.d.). Ocarina News. Retrieved 15 October 2009, http://www.ocarina.co.uk/news1.htm.

Look, U. (2005). Times Square. Max Neuhaus' Sound Work in New York City. *Open. Cahier on Art and the Public Domain*, *09* (Sound in Art and Culture), 82-92.

Luhmann, N. (1994). *Soziale Systeme : Grundriss einer allgemeinen Theorie* (5. Aufl ed.). Frankfurt am Main: Suhrkamp.

Lyons, D. (2008). There's Gold In Them iPhones. *Newsweek*.

Maebayashi, A. (1999). Sonic Interface. Retrieved February 2010, http://www2.gol.com/users/m8/installation.html.

Maksymowicz, V. (1992). Through the back door: alternative approaches to public art. In W. J. T. Mitchell (Ed.), *Art and the public sphere* (pp. 147-157). Chicago: University of Chicago Press.

Marcus, G., E. (1995). Ethnography in/of the world system: the emergence of multi-sited ethnography. *Annual Review of Anthropology*, *24*, 95-116.

Martin, M. (1991). *"Hello, Central?" gender, technology, and culture in the formation of telephone systems*. Montreal; London: London: McGill-Queen's University Press.

Marvin, C. (1990). *When old technologies were new: thinking about electric communication in the late nineteenth century*. New York; Oxford: Oxford University Press 1988.

Medosch, A. (n.d.). Hidden Histories - Hive Networks about to launch oral history trail in Southampton. Retrieved July 2008, http://www.thenextlayer.org/node/332.

Meehan, C. A. (2004). *Paper in* " Contemporary art and History Museums?" Session. Paper presented at the Museum Computer Network, Minneapolis.

Merrett, A. (2009). The 101 best iPhone apps in the world today. Retrieved 15 October 2009, http://www.techdigest.tv/2009/07/the_101_best_ip.html.

Micallef, S., Roussel, J., & Sawhney, G. (n.d.). [murmur]. Retrieved July 2008, http://murmurtoronto.ca/about.php.

Miles, M. (1997). *Art, space and the city : public art and urban futures*. London ; New York: Routledge.

Mitchell, W. J. T. (1992). *Art and the public sphere*. Chicago: University of Chicago Press.

Mitchell, W. J. (2003). *Me++ : the cyborg self and the networked city*. Cambridge, Mass. [u.a.]: MIT Press.

Moritz, F. (2009). Java in the Mobile Market: Google Android vs. JavaFX – Part 1: General Market Trends. Retrieved January 2010, http://www.centigrade.de/en/blog/article/java-in-the-mobile-market-google-android-vs-javafx-part-1-general-market-trends/.

Morley, D. (1992). *Television, Audiences and Cultural Studies*. Routledge.

Morley, D., & Silverstone, R. (1991). Communication and Context: Ethnographic Perspectives on the Media Audience. In N. W. Jankowski & K. B. Jensen (Eds.), *A Handbook of Qualitative Methodologies for Mass Communication Research* (pp. 149-162). London: Routledge.

Mott, I., Raszewski, M., & Sosnin, J. (1998). Sound Mapping. http://www.reverberant.com/SM.

Mott, I., & Sosnin, J. (1997). *Sound Mapping: An Assertion of Place*. Paper presented at the Proceedings of Interface '97, Houston, Texas.

Motte-Haber, H. d. l. (1998). Sound-Spaces-Fields-Objects. In B. Leitner (Ed.), *Sound, Space*. Ostfildern: Hatje Cantz Verlag.

Motte-Haber, H. d. l. (1999). *Klangkunst : tönende Objekte und klingende Räume*. Laaber: Laaber-Verl.

Motte-Haber, H. d. l. (2002). Esthetic perception in new articitc contexts. Aspects – hypotheses – unfinished thoughts. In *Resonanzen : Aspekte der Klangkunst. Resonances : aspects of sound art* (pp. 29-37). Heidelberg: Kehrer.

Motte-Haber, H. d. l. (2006). *KlangKunst - Sound Art : Sonambiente Berlin 2006 ; [anlässlich "Sonambiente Berlin 2006. Festival für Hören und Sehen "KlangKunst - Sound Art", 1,6,.16.7.]*. Heidelberg: Kehrer.

Mowlabocus, S. (2006). *Chat rooms and back rooms. Same-sex desire, cyberspace, and contemporary British gay male sub-culture*. University of Sussex, Falmer.

Muchmore, M. (2008). Ocarina (for iPhone). Retrieved 15 October 2009, http://www.pcmag.com/article2/0,2817,2336513,00.asp.

Mulder, A., & Brouwer, J. (2007). *Interact or Die!* NAI Publishers.

Mule. (2009). Smule Teams Up with the San Francisco Symphony. http://themulewashere.blogspot.com/2009/06/smule-teams-up-with-san-francisco.html.

Naughton, J. (2009). The iPhone Ocarina is the sound of serious money. *The Observer*.

Neuhaus, M. (1994). «Program Notes,» York University, Toronto, 1974,. In M. Neuhaus (Ed.), *inscription*. Ostfildern: Cited in Föllmer (2004) Audio Art.

New Art Trust. (n.d.). Media Matters - Collaborating Towards the Care of Time-based Media Works of Art. Retrieved 14.12.06, http://www.tate.org.uk/research/tateresearch/majorprojects/mediamatters/default.htm.

Norman, S. J. (2006). Locative Media & Instantiations Of Theatrical Boundaries. *Leonardo Electronic Almanac*, *14*(3).

O'Donovan, C. (2003). Murmurings: An interview with members of the [murmur] collective. YEAR ZERO ONE FORUM, *12*.

Obert, J. C. (2008). Sound and sentiment: A rhythmanalysis of television. *Continuum: Journal of Media & Cultural Studies*, *22*(3), 409-417.

Ong, W. J. (2000). *The Presence of the Word*. Binghampton Univeristy, NY: Global Publications.

Ouzounian, G. (2006). Embodied sound: Aural architectures and the body. *Contemporary Music Review*, *25*(1/2), 69 - 79.

Paraskevopoulou, O., Charitos, D., & Rizopoulos, C. (2008). Location-specific art practices that challenge the traditional conception of mapping. *artnodes. E-Journal on Art, Science and Technology*, *8*(2008).

Paul. (2007). Interview. Part of my field work. 28.04.2007, Cambridge (UK).

Paul, C. (2003). *Digital Art*. London, New York, N.Y.: Thames & Hudson.

Peters, J. D. (1999). *Speaking into the air: a history of the idea of communication*. Chicago, Ill., London: University of Chicago Press.

Pinch, T., & Bijsterveld, K. (2004). Sound Studies: New Technologies and Music. *Social Studies of Science*, *34*(5), 635–648.

Plant, S. (2001). On the Mobile. The effects of mobile telephones on social and individual life. Motorola Final Report. Retrieved 8 January 2009, http://www.motorola.com/mot/doc/0/234_MotDoc.pdf.

Plant, S. (2009). *Keynote*. Paper presented at the ISEA 2009, Belfast.

Pogue, D. (2009). So Many iPhone Apps, So Little Time. Retrieved 15 October 2009, http://www.nytimes.com/2009/02/05/technology/personaltech/05pogue-email.html?_r=1.

Poloni, O. (2005). Life doesn't last, art doesn't last, it doesn't matter. Retrieved January 2010, http://www.incca.org/.

Pope, S. (2005). The Shape of Locative Media. *metamute. culture and politics after the net*, *29*(the precarious issue).

Popper, F. (1993). *Art of the electronic age*. London: Thames & Hudson.

Porcello, T. (2007). Three Contributions to the “Sonic Turn”. *Current Musicology*, 83.

Prieberg, F. K. (1956). *Musik des Technischen Zeitalters*. Zürich, Freiburg/Br.: Atlantis.

Netbase, P. (2002). Basecamp Text FM. Retrieved January 2010, http://basecamp.netbase.org/e_index.html.

Ray, C. (2008). Conflux. Festival for contemporary psychogeography. http://confluxfestival.org/conflux2008/about/.

Reid, J., Hyams, J., Shaw, K., & Lipson, M. (2004). "Fancy a Schmink?" : a novel networked game in a cafe. *Computers in Entertainment (CIE)*, *2*(3), 11.

Rheingold, H. (2003). *Smart mobs : the next social revolution* (1. printing ed.). Cambridge: Perseus.

Roberts, B. (2009). Beyond the 'Networked Public Sphere': Politics, Participation and Technics in Web 2.0. *Fibreculture*, *14*.

Rocchesso, D. (2007). The COST IC0601 Action on Sonic Interaction Design (SID). Retrieved August 2009, http://www.cost-sid.org/.

Rogers, D. B. (2006). Penninsual Voices. Retrieved January 2010, http://www.streamarts.org.uk/projects/23.

Rohs, M., Essl, G., & Roth, M. (2006). *CaMus: Live Music Performance using Camera Phones and Visual Grid Tracking*. Paper presented at the New Interface for Musical Expression NIME, Paris.

Ronell, A. (1989). *The Telephone Book: Technology - Schizophrenia - Electric Speech*. University of Nebraska Press.

Rozie, J., Karahalios, K., & Donath, J. (n.d.). Hear&There. Retrieved July 2008, http://smg.media.mit.edu/projects/HearAndThere/.

Rueb, T. (2002). *Sonic Space-Time: Sound Installation and Secondary Orality*. Paper presented at the Consciousness Reframed, Perth.

Rueb, T. (2004a). Drift. In K. Kwastek, I. Arns, & N.-M. Faulstich (Eds.), *Ohne Schnur : Kunst und drahtlose Kommunikation* (pp. 210-219). Frankfurt am Main: Revolver, Archiv für Aktuelle Kunst.

Rueb, T. (2004b). Syncopated space – wireless media shaping human movement and social interaction. *receiver*, *10*.

Rueb, T. (2007). Network Landscapes. http://www.terirueb.net/courses/landscape_07.html.

Rueb, T., Conrad, E., & Behrendt, F. (2007). Interview with Teri and Erik, part of my field work. 20.09.2007, Cambridge (US)

Ruest, A. (2003). Track-The-Trackers. Printed Brochure.

Ruschkowski, A. (1998). *Elektronische Klänge und musikalische Entdeckungen*. Stuttgart: Reclam.

Russel, B. (2004). Trans Cultural Mapping Online Reader. Introduction. Retrieved February 2006, http://locative.net/tcmreader/index.php?intro;russell.

Sandelin, E., & Torsensson, M. (2007a). Pophorns Awarded in Stockholm. Retrieved 28.11.2008, http://www.pophorn.net/stories/2007/06/18/pophorns-awarded-in-stockholm/.

Sandelin, E., & Torsensson, M. (2007b). Bora Yoon Straps Ophonines at NYC Concert. Retrieved 28.11.2008, http://www.pophorn.net/stories/2007/08/02/bora-yoon-straps-ophonines-in-nyc-concert/.

Sandelin, E., & Torsensson, M. (n. d.). Pophorns Forum. Stories. Retrieved January 2010, http://www.pophorn.net/poptalk/viewforum.php?id=5.

Sandelin, E., & Torsensson, M. (n.d.). About. Retrieved 28.11.2008, http://www.pophorn.net/about/.

Sandelin, E., & Torsensson, M. (n.d.). Herrgarden Beatboxing. Retrieved 28.11.2008, http://www.unsworn.org/blog/mobile/2008/06/herrgarden-beatboxing/.

Sandelin, E., & Torsensson, M. (n.d.). Pophorns. Retrieved 28.11.2008, http://www.pophorn.net/.

Sandelin, E., & Torstensson, M. (2007a). Friday Interview with "Pophorns" Artists. Part of my field work. 07.09.2007, Malmö (Sweden)

Sandelin, E., & Torstensson, M. (2007b). Saturday Interview with "Pophorns" Artists. Part of my field work. 08.09.2007, Malmö (Sweden)

Sanio, S. (1999). Automonie, Intentionalität, Situation. Aspekte eines erweiterten Kunstbegriffs. In H. d. l. Motte-Haber (Ed.), *Klangkunst. Tönende Objekte und klingende Räume* (pp. pp 67-118). Laaber: Laaber-Verlag.

Sanio, S. (2003). Klangkunst – eine reflexive Entdeckungsbewegung. *Neue Zeitschrift für Musik*, *1/2003*, pp12-15.

Sarah. (2007). Interview. Part of my field work. 28.04.2007, Cambridge (UK).

Sassen, S. (2006). Public Interventions. The Shifting Meaning of the Urban Condition. *Open. Cahier on Art and the Public Domain, 11* (Public Agency in Hybrid Space), 18-26.

Saukko, P. (2003). *Doing Research in Cultural Studies: An Introduction to Classical and New Methodological Approaches (Introducing Qualitative Methods Series)*. SAGE Publications Ltd.

Schätzlein, F. (2001). Mobile Klangkunst. Über den Walkman als Wahrnehmungsmaschine. In A. Stuhlmann (Ed.), *Radio-Kultur und Hör-Kunst : zwischen Avantgarde und Popularkultur 1923 - 2001* (pp. 176-195). Würzburg: Königshausen&Neumann.

Schemat, S. (2004). Water (2004). In K. Kwastek, I. Arns, & N.-M. Faulstich (Eds.), *Ohne Schnur : Kunst und drahtlose Kommunikation* (pp. 200-209). Revolver, Archiv für Aktuelle Kunst.

Schiemer, G., & Havryliv, M. (2006). *Pocket Gamelan: swinging phones and ad hoc standards*. Paper presented at the Mobile Music Workshop, Amsterdam.

Schiffer, M. B. (1992). *The Portable Radio in American Life (Culture & Technology)*. University of Arizona Press.

Schmidt-Wulfen, S. (2004). On the "Publicness" of Public Art and the Limits of the Possible. In F. Matzner (Ed.), *Public Art. A Reader* (pp. 414-421). Hatje Cantz Verlag.

Schulz, B. (2002). Introduction. In *Resonanzen : Aspekte der Klangkunst. Resonances : aspects of sound art* (pp. 14-18). Heidelberg: Kehrer.

Schulze, H. (Ed.). (2008). *Sound Studies: Traditionen - Methoden - Desiderate: Eine Einführung*. Bielefeld: Transcript.

Schwendener, M. (2007). In Brooklyn, a Confluxion Junction. *New York Times*.

Seijdel, J. (2005). Editorial. *Open. Cahier on Art and the Public Domain*, *09* (Sound in Art and Culture), 4-5.

Seijdel, J. (2006). Editorial. Open. Cahier on Art and the Public Domain. *11* (Public Agency in Hybrid Space), 4-5.

Sharma, A. (2007). Playing Cellphones On Stage Has Ring Of Respectability. *Wall Street Journal*.

Sharon, M. (n.d.). Socialight. Retrieved March 2008, http://socialight.com/.

Sharpe, L. (2006). Swimming In The Grey Zones - Locating The Other Spaces In Mobile Art. *Leonardo Electronic Almanac*, *14*(3).

Shepard, M. (2008a). Tactical Sound Garden [TSG] Toolkit. In N. Kirisits, F. Behrendt, L. Gaye, & A. Tanaka (Eds.), *Creative Interactions - The Mobile Music Workshops 2004-2008* (pp. 92-93). Vienna: University of Applied Arts.

Shepard, M. (2008b). *Recircuiting the Social: Sound Tactics for Urban Public Space*. Paper presented at the Lecture in the Seminar Sound, Media & Urban Space, Providence.

Shirvanee, L. (2006). Locative Viscosity: Traces Of Social Histories In Public Space. *Leonardo Electronic Almanac*, *14*(3).

Silverstone, P. R. (1999). *Why Study the Media?* Sage.

Silverstone, R., & Hirsch, E. (1992). *Consuming Technologies: Media and Information in Domestic Spaces*. Routledge.

Silverstone, R., & Sujon, Z. (2005). Urban Tapestries: Experimental Ethnography, Technological Identities and Place. *MEDIA AT LSE Electronic Working Papers*, *7*.

Simun, M. (2009). My music, my world: using the MP3 player to shape experience in London. *New Media & Society*, *11*(6), 921-941.

Smule. (n.d.). Leaf Trombone World Stage™ . Retrieved 15 October 2009, http://leaftrombone.smule.com/.

Smule. (n.d.). What's Hot. Retrieved 15 October 2009, http://www.smule.com/whatshot.

Smule. (2009). Ocarina Songbooks. Retrieved 15 October 2009, http://www.smule.com/taxonomy/term/24/0.

snawbel, a. E. S. o. M. T. (n.d.). Pile of Pophorns. Retrieved 28.11.2008, http://www.youtube.com/watch?v=uo4U02sC_YE.

snawbel, a. E. S. o. M. T. (n.d.). Pophorning in Medellín. Retrieved 28.11.2008, http://www.youtube.com/watch?v=WO_cboiM66s.

Sorice, M. (2007). *Mobile Audiences. Methodological Problems and New Perspectives in Audience Studies*. Paper presented at the Conference Transforming Audiences. Identity, Creativity, Everyday Life, London.

Souza e Silva, A. d., & Hjorth, G. F. L. (2009). Mobile gaming: Review of issue and developments. *Simulation & Gaming*, *40*(1).

Souza e Silva, A. d. (2006). From cyber to hybrid: mobile technologies as interfaces of hybrid spaces. *Space and Culture*, *9*(3), 261-278.

Souza e Silva, A. A. d. (2004). From Cyber to Hybrid. Relocating our Imaginary Spaces through Mobile Interfaces. Federal University of Rio de Janeiro, Brazil, Rio de Janeiro.

Standage, T. (1998). *The Victorian internet: the remarkable story of the telegraph and the nineteenth century's online pioneers*. London:.

stanton, d. d. (2009). Retrieved 15 October 2009, http://www.techcrunch.com/2009/02/12/innovative-iphone-developer-smule-raises-39-million/ In: Kincaid, Jason. Innovative iPhone Developer Smule Raises $3.9 Million.

Sterne, J. (2003). *The audible past : cultural origins of sound reproduction*. Durham: Duke University Press.

Sterne, J. (2006). The mp3 as Cultual Artefact. *New Media & Society*, *8*(5), 825–842.

Sterne, J., Morris, J., Baker, M. B., & Freire, A. M. (2008). The Politics of Podcasting. *Fibreculture*, *13*.

Supper, M. (1998). *Elektronische Musik und Computermusik*. Darmstadt: Wissenschaftliche Buchgesellschaft.

Symons, S. (2004). Aura: The stuff around the stuff around you. In M. Tuters & R. Smite (Eds.), *Acoustic Space. Trans Cultural Mapping* (pp. 170-171). Riga: The Centre for New Media Culture RIXC.

Symons, S. (2007a). *Artist's Talk*. Paper presented at the Enter_ Festival, Cambridge (UK).

Symons, S. (2007b). Artist Interview with Steve Symons, conducted by Frauke Behrendt.

Symons, S. (n.d.). aura:the stuff that forms around you. Retrieved January 2008, http://www.muio.org/projectviewer.php?project=aura2.

Symons, S. (n.d.). aura. the stuff around the stuff around you. Article. Retrieved 20 November 2009, http://www.muio.org/projects/aura/acousticspace.pdf.

Tanaka, A. (2004). *Malleable Mobile Music*. Paper presented at the Mobile Music Technology Workshop, Gothenburg.

Tanaka, A. (2005). Malleable Contents and Future Musical Forms. *receiver*, *13*.

Tanaka, A. (2007). Facilitating Musical Creativity: In Collectivity and Mobility. *Leonardo Electronic Almanac*, *15*(5).

Tarkka, M. (2005). Labours of Location: acting in the pervasive media space. http://diffusion.org.uk/?p=105.

The Mule. (n.d.) SonicMule's "This Contest Blows" Contest is. finally. OVER!!! Retrieved 15 October 2009, http://ocarina.smule.com/contest.

The Mule. (2008a). Smule: The "This Contest Blows" Contest for iPhone Ocarina. Retrieved 15 October 2009, http://www.youtube.com/watch?v=8863gYtVaSc&feature=video_response.

The Mule. (2008b). Win $1,000 in an Epic Ocarina Contest from Smule!! Retrieved 15 October 2009, http://themulewashere.blogspot.com/2008/12/epic-ocarina-contest-from-smule.html.

The Mule. (2009a). Contest coming to an end. $5000 to be given next monday. Retrieved 15 October 2009, http://themulewashere.blogspot.com/2009/02/contest-coming-to-end-5000-to-be-given.html.

The Mule. (2008c). Sonic Vox Released Today!!! Retrieved 15 October 2009, http://themulewashere.blogspot.com/2008/10/sonic-vox-released-today.html.

The Mule. (2008d). Ocarina: The First wind instrument on the iPhone! Retrieved 15 October 2009, http://themulewashere.blogspot.com/2008/11/ocarina-first-wind-instrument-on-iphone.html.

The Mule. (2009b). Top 20 Apps of All TIME!!! Retrieved 15 October 2009, http://themulewashere.blogspot.com/2009/04/top-20-apps-of-all-time.html.

The Mule. (2009c). Smule at iPhone Software 3.0 Announcment. Retrieved 15 October 2009, http://themulewashere.blogspot.com/2009/03/smule-at-iphone-software-30-announcment.html.

Theberge, P. (1997). *Any sound you can imagine: making music/consuming technology*. Hanover, N.H.; London: Wesleyan University Press [and] University Press of New England.

Thompson, E. (2004). *The Soundscape of Modernity: Architectural Acoustics and the Culture of Listening in America, 1900-1933*. The MIT Press.

Redfern, T., & Borland, R. (2007). Interview at Conflux.

Tofts, D. (2007). Dead to the World: The future of hand-held art. *Scan Journal*, *4*(3).

Tonelli, C. (2009) The Chiptuning of the World: Game Boys, Imagined Travel, and Musical Meaning. Paper presented at the Mobile Music for Everyday People: A Symposium on Mobile Music and Sound, Minneapolis.

Toop, D. (2000). *Sonic boom : the art of sound*. London: Hayward Gallery Publishing.

Toop, D. (2004). *Haunted weather : music, silence and memory*. London: Serpent's Tail.

Troika. (2005). Tool for Armchair Activists. Retrieved January 2006, http://www.troika.uk.com/armchair_activists.htm.

Tuters, M., & Varnelis, K. (2006). Beyond Locative Media: Giving Shape to the Internet of Things. *Leonardo*, *39*(4), 357-363.

Uimonen, H. (2004). 'Sorry, can't hear you! I'm on a train!' Ringing tones, meanings and the Finnish soundscape. *Popular Music*, *32*(1), 51-62.

Jerusalem, U. o. (n.d.). Elisha Grey. Retrieved 20 November 2009, http://chem.ch.huji.ac.il/history/gray_elisha.html.

Van Elferen, I., & De Vries, I. (2007). *Floating Fabulousness: Representation, Performativity and Identity in Musical Ringtones*. Paper presented at the 4th International Mobile Music Workshop, Amsterdam.

Walkowitz, D. J. (2009). *Contested Histories in Public Space: Memory, Race, and Nation (Radical Perspectives)*. Duke University Press.

Wang, G. (2009). *Designing Smule's Ocarina: The iPhone's Magic Flute*. Paper presented at the International Conference on New Interfaces for Musical Expression (NIME), Pittsburg.

Wang, G., Essl, G., & Penttinen, H. (2008). *Do Mobile Phones dream of Electronic Orchestras?* Paper presented at the International Computer Music Conference, ICMC, Belfast, Northern Ireland.

Wang, G., Trueman, D., Smallwood, S., & Cook, P. R. (2008). The Laptop Orchestra as Classroom. *Computer Music Journal*, *32*(1), 26-37.

Weidenaar, R. (1995). *Magic music from the telharmonium*. Metuchen, N.J: Scarecrow Press.

Weinberg, G., Beck, A., & Godfrey, M. (2009). *ZooZBeat: a Gesture-based Mobile Music Studio*. Paper presented at the International Conference on New Interfaces for Musical Expression (NIME), Pittsburgh.

Widerberg, R., & Hasan, Z. (n.d.). IMPROVe'd sites. Retrieved January 2010, http://www.riwid.net/improve/demo/.

Wieczorek, W. (2006). *Park Fiction - Eine andauernde Geschichte der praktischen Stadtkritik*. Paper presented at the Park Fiction präsentiert: Umsonst & Draussen, Hamburg.

Wilson, S. (2002). *Information arts : intersections of art, science and technology*. Cambridge, Mass. ; London: MIT Press.

Wishart, T. (1985). *On sonic art*. York: Imagineering Press.

Wittel, A. (2000). Ethnography on the Move: From Field to Net to Internet. *Forum: Qualitative Social Research*, *1*(1).

Young, P. (1991). *Person to person: the international impact of the telephone*. Cambridge: Granta Editions.

X. Artography

'A Simulation of a Reconstruction by Remote means' by Mark Bain (Amsterdam, Netherlands, +), 2003

'Audio Graffiti' by Chia-Ying Lee (Ivrea, Italy, +), 2006

'Audio Nomad' by Nigel Helyer (Sydney, Australia, +), 2004

'Augmented Reality Fiction' by Isabella Bordoni, Roberto Paci Dalò & Stefan Schemat (Linz, Austria, +), 1999

'aura: the stuff that forms around you' by Steve Symons (Cambridge, UK), 2007

'aura. the stuff around the stuff around you' by Steve Symons (Manchester, UK, +), 2004

'Berlin Alexanderplatz 5.0' by Stefan Schemat (Berlin, Germany), 1999

'BubL Space' by Elsenaar & Stolk (Helsinki, Finland, +), 2002

'CaMus' by Michael Rohs, Georg Essl and Martin Roth (Berlin, Germany, +), 2006

'Cellphonia. In The News' by Steve Bull (San Jose, USA, +), 2006

‘Contact’ by Mark Bain (Amsterdam, Netherlands), 2003

'Core Sample' by Teri Rueb (Boston, USA), 2007

'Craving' by Bernhard Garnicnig & Gottfried Haider (Vienna, Austria, +), 2008

'Daisyphone' by Nick Bryan-Kinns and Patrick Healey (Glasgow, UK, +), 2003

'Dialtones. A Telesymphony' by Golan Levin, Gregory Shakar, Scott Gibbons & others (Linz, Austria, +), 2001

'drift' by Teri Rueb (Cuxhaven, Germany), 2004

'Elsewhere: Anderswo' by Teri Rueb (Neuenkirchen, Germany), 2009

'Hear&There' by Joey Rozie, Karrie Karahalios & Judith Donath (Cambridge, USA), 1999

'Her Long Black Hair' by Janet Cardiff (New York City, USA), 2004

'Hidden Histories' by Armin Medosch (London, UK), 2008

'Hlemmur in C' by Pall Thayer (Reykjavik, Iceland), 2004

'IMPROVe' by Richard Widerberg and Zeenath Hasan (Helsinki, Finland, +), 2006

'Infection' by Stefan Schemat (Germany), 2000

'InterUrban' by Jeff Knowlton, Naomi Spellman & Jeremy Hight (Manchester, UK), 2004

'Kadoum' by Johan Waagenaar (Zurich, Switzerland, +), 2000

'Location 33: A Mobile Musical' by William Carter and Leslie S. Liu (Culver City, USA), 2005

'Malleable Mobile Music' by Atau Tanaka (Paris, France), 2003

'Mandala 3 and Mandala 4' by Greg Schiemer (Wollongong, Australia, +), 2006

'murmur' by Shawn Micallef, James Roussel & Gabe Sawhney (Toronto, Canada, +), 2003

'Musical Devices' by Jonah Brucker-Cohen (USA), 2001

'nanoloop imode' by Oliver Wittchow (Germany), 2001

'New Ring Cycle' by Turner and Moore (Cheltenham, UK), 2002

'Oasis 2000: Music for a Concrete Jungle' by Christina Kubisch (London, UK), 2000

'Ocarina' by Ge Wang, 2009

'One Free Minute' (previously 'SanJoseVoices') by Daniel Jolliffe (Columbus, USA, +), 2005

'Otodate' by Akio Suzuki (Berlin, Germany), 1996

'Pedestrian: A Walking Tour for Multiple Voices and Portable Phones' by Jennifer Bainbridge, Jessica Bathurst, Shoshana Polanco & al. (New York City, USA), 2005

'Penninsual Voices' by Daniel Belasco Rogers (London, UK), 2006

'Pimp my heart' by Takehito Etani (Pittsburgh, USA), 2006

'Pophorns' by Erik Sandelin & Magnus Torstensson (Malmö, Sweden, +), 2007

'SanJoseVoices' by Jolliffe (San Jose, USA), 2006

'Schminky' by Mobile Bristol (Bristol, UK), 2003

'Silver Cage' by Aram Bartholl (Berlin, Germany, +), 2004

'Sky Ear' by Usman Haque (London, UK), 2004

'smSage' by by Tim Redfern and Ralph Borland (New York City, USA), 2007

'Sonic City' Lalya Gaye, Ramia Mazé & Lars-Erik Holmquist (Göteborg, Sweden), 2003

'Sonic Interface' by Akitsugu Maebayashi (Rotterdam, Netherlands, +), 1999

'Sound Mapping' by Ian Mott, Marc Raszewski & Jim Sosnin (Hobart, Australia, +), 1998

'Soundbike' by Thompson (Cambridge, USA), 2005

'Spoonbridge and Cherry' by Pierre Huyghe (Minneapolis, USA), 2009

'Spring Cellphony' by unknown artists (Jerusalem, Israel), 2001

'Stanford Mobile Phone Orchestra' by Ge Wang, Jieun Oh, Nick Bryan, Jorge Herrera & al (Stanford, USA, +), 2007

'Tactical Soundgarden Toolkit' by Mark Shepard (Barcelona, Spain, +), 2004

'Telenono' by Rupert Griffith (Manchester, UK), 2004

'Telephony' by Thomson and Craighead (London, UK), 2000

'Telesymphony' by Golan Levin (Linz, Austria), 2001

'TextFm' by Matthew Fuller & Graham Harwood (London, UK, +), 2002

'Times Square' by Max Neuhaus (New York City) 1977

The 'Handydandy' by Kirisits Nicolaj & al (Vienna, Austria, +), 2005

'Trace' by Teri Rueb (Yoho National Park, Canada), 1999

'tunA' by Arianna Bassolli, Julian Moore & Stefan Agamanolis (Dublin, Ireland), 2003

'Wählt die Signale' by Ligna (Hamburg, Germany), 2003

'Wasser' or 'Water' by Stefan Schemat (Cuxhaven, Germany), 2004

‘Tool for Armchair Activists’ by ‘Troika’ (Sebastien Noel, Conny Freyer, Eva Rucki & Moritz Waldemeyer (London, UK), 2005

‘Mobilescout’ by Julian Bleecker, 2005

'34 North 118 West' by Jeff Knowlton, Naomi Spellman, Brandon Stow, & Jeremy Hight (Los Angeles, USA), 2002